MONTHLY WEATHER REVIEW.

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INTRODUCTION.

The MONTHLY WEATHER REVIEW for October, 1905, is based on data from about 3495 stations, classified as follows:

Weather Bureau stations, regular, telegraph, and mail, 176; West Indian Service, cable and mail, 13; River and Flood Service, regular 52, special river and rainfall, 363, special rainfall only, 98; cooperative observers, domestic and foreign, 2565; total Weather Bureau Service, 3267; Canadian Meteorological Service, by telegraph and mail, 33; Meteorological Service of the Azores, by cable, 2; Meteorological Office, London, by cable, 8; Mexican Telegraph Company, by cable, 3; Army Post Hospital reports, 18; United States Life-Saving Service, 9; Jamaica Weather Service, 130; Costa Rican Meteorological Service, 25. Total, 3495.

Since December, 1904, the Weather Bureau has received an average of about 1700 reports from as many observers and vessels, giving international simultaneous observations over the Atlantic and Pacific oceans at 12 noon, Greenwich time, or 7 a. m., seventy-fifth meridian time. These are charted, and, with the corresponding land observations, will form the framework for daily weather charts of the globe.

Special acknowledgment is made of the hearty cooperation of Prof. R. F. Stupart, Director of the Meteorological Service of the Dominion of Canada; Señor Manuel E. Pastrana, Director of the Central Meteorological and Magnetic Observatory of Mexico; Camilo A. Gonzales, Director-General of Mexican Telegraphs; Capt. S.I. Kimball, General Superintendent of the United States Life-Saving Service; Capt. H. M. Hodges, U. S. N. (Retired), Hydrographer, United States Navy; Anastasio Aljaro, Director of the Physico-Geographic Institute, San José, Costa Rica; Commandant Francisco S. Chaves, Director of the Meteorological Service of the Azores, Ponta Delgada, St. Michaels, Azores; W. N. Shaw, Esq., Secretary, Meteorological Office, London; H. H. Cousins, Chemist, in charge of the Jamaica Weather Office; Señor Enrique A. Del Monte, Director of the the Meteorological Service of the Republic of Cuba; Rev. L. Gangoiti, Director of the Meteorological Observatory of Belen College, Havana, Cuba.

Attention is called to the fact that at regular Weather Bureau stations all data intended for the Central Office at Washington are recorded on seventy-fifth meridian or eastern standard time, except that hourly records of wind velocity and direction, temperature, and sunshine are entered on the respective local standards of time. As far as practicable, only the seventy-fifth meridian standard of time, which is exactly five hours behind Greenwich time, is used in the text of the REVIEW. The standards used by the public in the United States and Canada and by the cooperative observers are believed to conform generally to the modern international system of standard meridians, one hour apart, beginning with Greenwich. The Hawaiian standard meridian is 157° 30′, or $10^h\ 30^m$ west of Greenwich. The Costa Rican standard meridian is that of San José, $5^h\ 36^m$ west of Greenwich.

Barometric pressures, whether "station pressures" or "sea-level pressures", are now reduced to standard gravity, so that they express pressure in a standard system of absolute measures.

In conformity with Instructions No. 43, March 29, 1905, the designation "voluntary", as applied to the class of observers performing services under the direction of the Weather Bureau without a stated compensation in money, is discontinued, and the designation "cooperative", will be used instead in all official publications and correspondence.

Hereafter the titles of the respective forecast districts will be as used in the current REVIEW to accord with paragraph 236 of Station Regulations, dated June 15, 1905.

FORECASTS AND WARNINGS.

By Prof. E. B. GARRIOTT, in charge of Forecast Division.

The month opened with high northwest winds on the North Sea, and during the 4th and 5th west to north gales prevailed on the British coasts. Barometric pressure was high over the British Isles from the 7th to 14th and 17th to 25th, and low on the 15th and 16th and from the 26th to 29th. In the vicinity of the Azores pressure was low during the first decade of the month and rising or high from the 10th to 15th, 18th to 20th, and 23d to 31st. On the 9th the barometer fell to 29.70 at Horta, Fayal, and the wind reached a velocity of 46 miles an hour from the south. During the 21st and 22d a barometric disturbance moved eastward over the Azores, with pressure falling to 29.66 on the 22d. Passing eastward the Azores storm reached Portugal and Spain, with lowest reported barometer reading, 29.42, at Lisbon on the 24th, and the barometer rose at that place to 29.50 on the morning of the 25th and to 29.88 by the morning of the 26th.

The only West Indian disturbance of marked intensity appeared over the Caribbean Sea south of San Domingo on the 3d and 4th, recurved north near the Windward Passage on the 5th, and passed in a northerly course to the westward of Turks Island on the 6th. From the eastern Bahamas this disturbance moved northeastward and passed to the south and east of Bermuda during the afternoon of the 8th. A fresh east to northeast gale prevailed during the day and night of the 8th at Bermuda, and the barometer at Hamilton at 8 p. m. was 29.66 inches. To the east and southeast of Bermuda gales of hurricane force were reported. From the vicinity of Bermuda the center of the storm moved northeastward to the Banks of Newfoundland. The action of the storm was not severe until after recurving northeastward from the Bahamas, when the barometric pressure began to decline rapidly, with a corresponding increase in wind force. In about latitude 45° north and longitude 45° west the steamship *La Savoie*, at 4 p. m. of the 11th, reported a barometric reading of 27.92 inches; and a disastrous storm-wave, within its area, was encountered on the same day by the steamship *Campania*. Advices to West Indian, Gulf, and Atlantic coast interests regarding the storm were begun October 3 and continued daily until it recurved northeastward over the Atlantic. On the 6th advices to Bermuda and Halifax regarding its movement were begun and

were continued until it passed Bermuda, and on the morning of the 9th Lloyds, London, was advised by cable that a tropical disturbance was moving northeastward from Bermuda.

In the United States twelve of the thirteen areas of low pressure of the month belong to two well-defined types. The greater number developed or first appeared over the southern Rocky Mountain and Plateau regions; five advanced from the extreme Northwest, and one from the Gulf of Mexico. The high areas also followed uniform tracks and advanced from the Northwest to the central valleys and thence eastward to the Atlantic coast districts.

The first important storm of the month moved from the Gulf of Mexico northeastward to the Canadian Maritime Provinces from the 9th to 12th attended throughout by heavy rain and high winds. On the 11th this disturbance was joined, over eastern New York, by an area of low pressure that appeared over the north Pacific coast district on the 7th, advanced in a general easterly direction to Ontario, and moved thence southeastward. From the 13th to the 16th, a disturbance moved from the middle Rocky Mountain region northeastward over Lake Superior and thence eastward toward the Gulf of St. Lawrence attended on the 15th by gales on the Great Lakes. Great damage to shipping was caused, especially on Lake Erie, by a storm, low area IX, that advanced from the middle Plateau over the lower Missouri Valley and thence northeastward from the 18th to 21st. Speaking of the action of the Weather Bureau in connection with this storm the Buffalo Courier says:

> The accuracy of the forecasts regarding the terrific gale which recently swept the Lake region is well worthy of being noted. Wednesday morning warnings were issued that Lake vessels ought not to leave port unless they could reach their destinations before Thursday afternoon. Thursday morning storm signals were displayed and another special warning given. The storm, which at Buffalo attained a velocity of 78 miles on hour Friday morning, was precisely as predicted, and information of its coming had been given at all important points on its route. Vessels were wrecked and lives destroyed by the commotion of wind and wave. Probably they were beyond reach of the warnings, or neglected them. It is fully as probable that many vessels stayed safely in harbor because the Weather Bureau forecasts were heeded.

Under the combined influence of low area XI and high area X strong northeast winds prevailed off the Virginia and Carolina coasts on the 26th. A maximum velocity of 52 miles an hour was reported at Cape Henry, Va. On account of the wind and high sea many vessels sheltered in Hampton Roads.

Low barometric pressure over Arizona and New Mexico and the northeastward movement from the Gulf of Mexico of a barometric depression was followed by a sweep of high pressure from the Northwest that carried frost bearing temperatures to northern Arkansas by the 11th, and to the interior of the middle and east Gulf and South Atlantic States by the mornings of the 12th and 13th. Light frost occurred at Pensacola on the 12th and at Mobile on the 13th. High area VII following the passage of low area IX caused frost in the middle and northern portions of the Gulf States. Attending high area VIII light and heavy frost occurred on the 22d and 23d in the middle and east Gulf and South Atlantic States.

The first snow of the season was noted in the Lake region and Ohio Valley on the 11th, and in western Pennsylvania and interior of New York on the 12th. On the 28th snow fell in eastern Kansas, western Missouri, and the Northwest.

The Chief of Bureau is pleased to acknowledge the receipt of a communication from the Jacksonville Board of Trade, Jacksonville, Fla., appreciative of the great service of the U. S. Weather Bureau to the various industries of that State.

BOSTON FORECAST DISTRICT.

The weather was exceptionally pleasant, with an unusual prevalence of sunshine, an equable distribution of moderate temperatures, and a marked deficiency in precipitation. Snow fell in many northern sections, but only traces, with the exception of one inch at Enosburg Falls, Vt. The few storms of the month were of light to moderate intensity, and no destructive winds were experienced along the coast. Storm warnings were issued on the 11th, 20th, and 26th. Frost warnings were issued to the cranberry growers on the 12th, and were verified by moderate to killing frosts. The first killing frost at Boston occurred on the 26th, with minimum temperature at freezing.—*J. W. Smith, District Forecaster.*

NEW ORLEANS FORECAST DISTRICT.

Storm warnings were issued for the central Gulf coast on the 8th and 9th and were fully justified. Frost warnings were issued for portions of the district on the 10th, 11th, 15th, 19th, and 20th, and frost occurred over a great portion of the areas named in the forecasts, except on the 16th. No frosts occurred without timely warnings having been issued. The following press comments show how the work of the Weather Bureau is appreciated. The New Orleans Item, in speaking of the storm of the 8–9th, says:

> The Weather Bureau sent out storm warnings Sunday morning in advance of the high winds, advising shipping and public interests fully regarding anticipated conditions.

In connection with the frost warnings issued by the Weather Bureau, the Daily Picayune of October 13 says:

> Frost warnings issued by the Weather Bureau have proven of incalculable benefit to the sugar and trucking interests along the Gulf coast, and in periods of epidemics of yellow fever the warnings are additionally interesting because the first appearance of frost, which kills the progress of the fever, heralds the resumption of interstate and interurban business by the withdrawal of quarantines. Special bulletins predicting frosts in northern Louisiana were issued Wednesday and were fully verified yesterday morning.

I. M. Cline, District Forecaster.

CHICAGO FORECAST DISTRICT.

Easterly warnings were ordered on the 14th and changed to northwest on the 15th, as a storm approached the Lake region from the Middle West. This storm was accompanied by general high winds, especially after the winds shifted to the west, and some wrecks were reported; but it is thought that the losses were not greater on account of the ample warning that all interests received. The most severe storm of the month appeared in the Plateau region on the 18th, and by the morning of the 19th it had crossed the Rockies and reached the Missouri Valley. It developed rapidly during the 19th and by the morning of the 20th had crossed the upper Lake region and reached Ontario. During its passage general gales prevailed on all the Lakes, the wind reaching maximum velocities not previously attained this year. Although general warnings were issued in advance of the storm, wrecks reported were numerous, many smaller craft being wiped out of existence. On all lakes 34 vessels were reported lost, but they were chiefly of a kind that is not being built at the present time. Northwest warnings were again ordered on the 31st at all stations for another disturbance which passed over the upper Lakes accompanied by general high winds, maximum velocities being reported from nearly all stations. No wrecks occurred as far as known. Frost warnings were issued as follows: On the 10th for the entire district, except Michigan and Indiana, to which States they were extended on the 11th. Frost was again predicted on the 20th and, while all these warnings were fully verified, it is not known whether any benefits were derived.—*H. J. Cox, Professor and District Forecaster.*

DENVER FORECAST DISTRICT.

An excess of precipitation was noted in Wyoming and north-central Colorado and, except along the southern border of the district, the month was colder than usual. The early part of the month was warm, but after the 8th temperatures were almost continually below the seasonal average. Strictly speaking, there were no cold waves, and the only special warnings issued were for frosts.—*F. H. Brandenburg, District Forecaster.*

SAN FRANCISCO FORECAST DISTRICT.

The month was one of nearly normal conditions, except that there was less rain than usual. The unexpected development of a high area on the north Pacific coast on the 7th caused clear, cold weather in California and Nevada, with heavy frosts in mountain sections. This high practically controlled conditions until the middle of the month. Another high area controlled the weather from the 18th to the 22d.—*A. G. McAdie, Professor and District Forecaster.*

PORTLAND FORECAST DISTRICT.

A stormy period set in on the 1st which culminated on the 6th in one of the worst gales ever known so early in the season. The North Head and Tatoosh Island stations reported maximum wind velocities of 72 miles from the southeast and east, respectively, on that date; at Seattle the maximum velocity was 48 miles from the south and at Tacoma it was 40 miles from the southwest. Warnings for this series of storms were issued well in advance of their occurrence and the casualities that occurred were of minor importance. Other gales occurred on the 17th and the 24th for which warnings were issued. No storms occurred without warnings.

On the 10th, killing frosts occurred in the sections of the districts east of the Cascade Mountains, and on the 18th, killing frosts were reported generally in the western sections. The frost warnings issued in the sections of the district east of the Cascade Mountains were timely, but those issued for localities west of the Cascade Mountains were only partially verified.—*E. A. Beals, District Forecaster.*

RIVERS AND FLOODS.

The work of the River and Flood Service was practically featureless during the month. In nearly all the rivers the stages of water were lower than during the month immediately preceding, although not quite so low as is usual during the month of October. There was, however, sufficient water for steamboat traffic in the navigable rivers, except the Tennessee.

The highest and lowest water, mean stage, and monthly range at 270 river stations are given in Table VI. Hydrographs for typical points on seven principal rivers are shown on Chart V. The stations selected for charting are Keokuk, St. Louis, Memphis, Vicksburg, and New Orleans, on the Mississippi; Cincinnati and Cairo, on the Ohio; Nashville, on the Cumberland; Johnsonville, on the Tennessee; Kansas City, on the Missouri; Little Rock, on the Arkansas; and Shreveport, on the Red.—*H. C. Frankenfield, Professor of Meteorology.*

CLIMATE AND CROP SERVICE.

By Mr. JAMES BERRY, Chief of Climate and Crop Divison.

The following summaries relating to the general weather and crop conditions during October are furnished by the directors of the respective sections of the Climate and Crop Service of the Weather Bureau; they are based upon reports from cooperative observers and crop correspondents, of whom there are about 3300 and 14,000, respectively:

Alabama.—The weather was wet and unfavorable for maturing and gathering cotton and corn, though fairly favorable for late minor crops. Some cool nights, with heavy to killing frosts, but latter too late for material damage. Rain damaged much open cotton and retarded picking, though about nine-tenths of the crop was gathered by the close of the month, with generally light yield. Corn yielded well, but the quality was inferior and the crop was not all housed. Minor crops were satisfactory. Little fall plowing or seeding was done.—*F. P. Chaffee.*

Arizona.—Rainfall greatly deficient. Temperature evenly distributed. Frost injured fruit and vegetables slightly. Plowing extensive toward the latter part of the month; very little grain sown. Cutting of corn completed over the south, much unmatured over the central section. Fall and winter gardens yielding splendidly, the sixth crop of alfalfa gathered and seventh blooming, over southern counties. Oranges ripe at end of month; yield most promising. Olive picking continued. Winter Nellis pears ripening. Range grass scarce over the southwestern section. Water for stock diminishing; irrigation water plentiful. All stock doing well.—*L. N. Jesunofsky.*

Arkansas.—General and heavy rains on the 18th, 19th, 24th, and 25th injured cotton to a considerable extent and retarded picking. About two-thirds of the cotton crop was secured by the close of the month, with a poor to fair yield. Corn was all housed, with generally poor yield. Sweet and late Irish potatoes were being gathered, with fair to good yields. Fall plowing made good progress during the month. Much wheat was sown and the early planted came up to a good stand.—*C. M. Strong.*

California.—Abnormally dry, clear weather prevailed most of the month, with occasional heavy fogs in the coast districts, northerly winds, and light rains. Frosts in the interior caused no damage. Conditions were very favorable for citrus fruits and for completing the season's work in fruit drying, raisin making, hay baling, and harvesting beans and corn. The orange crop was in first class condition, and the first car load was shipped east from Tulare County on the 28th.—*Alexander G. McAdie.*

Colorado.—During the closing days farming operations on the eastern slope were seriously interrupted by heavy snow and freezing weather, delaying potato digging and beet pulling, one-half of these crops being still unharvested; otherwise conditions were generally favorable to ripening and harvesting outstanding crops. In the north-central division the area plowed and seeded was smaller than usual. Except in a few localities, where the moisture was insufficient, fall wheat and rye germinated nicely.—*Frederick H. Brandenburg.*

Florida.—The temperature averaged about normal. The deficiency in precipitation exceeded an inch. The cotton crop was practically housed, averaging about two-thirds of a crop. The month was excellent for harvesting, but unfavorable for seeding, germination, and growth of vegetables. The dry weather was particularly unfavorable over the greater part of the central district, where work was suspended. Citrus fruits colored rapidly and improved in quality; shipments increased. The crop promised to be less than that of the previous year.—*A. J. Mitchell.*

Georgia.—Conditions were about normal. Temperatures were low on the 21st–24th, killing frost general over the north, light to heavy in other sections. The rainfall was well distributed. Cotton picking was about completed; the crop was below average, but better in some districts than had been expected; bulk of crop marketed. Corn harvesting completed in some sections; yield fair to good. Potatoes good crop. Turnips poor; other minor crops about an average. Fall plowing and seeding was progressing rapidly at the close of the month; acreage of wheat to be increased.—*J. B. Marbury.*

Hawaii.—See corrigenda.

Idaho.—Harvest of sugar beets and late fruits progressed throughout the month. In elevated districts some fruit was frozen on the trees. Range stock generally found ample subsistence, but in some localities feed was short. In northern wheat growing districts moisture was sufficient for soil preparation, but elsewhere the ground was very dry most of the month.—*Edward L. Wells.*

Illinois.—The first killing frost of autumn occurred on the morning of the 12th. Corn was fully matured and no damage ensued. Farming operations were interrupted by rains, excessive in the southern district, but good progress was made in plowing and in husking and cribbing corn. Corn was yielding well in the northern and southern districts, but was below expectations in the central. The outlook for wheat was uniformly favorable. Apples were scarce and of inferior quality. The potato output was below average.—*Wm. G. Burns.*

Indiana.—In the south portion of the State frequent rains retarded wheat sowing; in the north portion, where conditions were more favorable, fall seeding was completed. Killing frosts on the 11th, 12th, and 21st shortened the tomato crop, but did no other damage. The corn crop was heavy; it dried slowly and in places was down and rotting. The potato crop was light. Tobacco was safely housed. Apples were scarce; pears were plentiful. Pastures were fairly good.—*W. T. Blythe.*

Iowa.—The first decade was very favorable for ripening latest planted corn, and the crop was wholly safe before killing frost on the 11th. About the middle of the month heavy rains caused some damage to corn that had been flattened by wind. The last decade brought good weather for cribbing and fair progress was made. Increased acreage of wheat made good stand. All minor crops were well secured and pastures were excellent at close of the month.—*John R. Sage.*

Kansas.—Wheat was in good condition, but needed rain in the central and western portions of the State. It was generally making slow growth. Corn husking was progressing satisfactorily and the crop was generally good, but it was too wet in the eastern counties, where much corn was rotting. Apple picking and potato digging were in progress, with fair crops. The fifth crop of alfalfa was stacked. Cattle and pastures were doing well.—*S. D. Flora.*

Kentucky.—Periods of rain were the 1st–3d, 10–11th, 15–20th, 24–26th,

and 31st, the average for the State being greater than any previous record for October. As nearly all crops were gathered, little damage resulted, except delay in sowing grain and digging potatoes. Plowing was mostly completed and grain mostly sown at the close of the month. Light frost occurred on the 11th, general heavy frosts on the 12th, and killing on the 21st. The temperature for the month averaged slightly below normal.—*F. J. Walz.*

Louisiana.—Heavy rains and high winds early in October were unfavorable. Cotton picking was retarded, lint blown out and discolored, and some seed sprouted in bolls. With more favorable weather in latter part picking progressed rapidly, was completed in some sections and nearing completion generally. The yield was much below average. Sugar cane was blown down and damaged to some extent; a heavy tonnage was being harvested, but sugar yields was not up to expectations. Light rice and corn crops were housed, with but slight damage. Truck gardens suffered from washing rains early in the month, but made good progress later.—*I. M. Cline.*

Maryland and Delaware.—The weather was favorable for farm work, with sufficient precipitation and seasonable temperature. Killing frost occurred at a number of stations, but not universally. Wheat attained a good stand; some yet to sow. Corn husking was advanced rapidly, with a large crop of fine quality. Apples were a good crop. Late vegetables abundant.—*C. F. von Herrmann.*

Michigan.—October weather was generally very favorable for securing very late corn and sugar beets and for apple picking and corn husking. Heavy and killing frosts occurred much later than usual this year and practically all corn fully matured. Winter wheat and rye germinated and grew well, but wheat, especially the early seeding, was more or less infested with hessian fly.—*C. F. Schneider.*

Minnesota.—The day temperatures were moderately high until the 11th, though there were freezing temperatures in northern and central portions before that date. Corn was ripe before killing frost in the region where corn is grown. From the 2d to the 8th the weather was fine and favorable for finishing much thrashing and for plowing and corn husking. A heavy snow extended across the southern part of the State on the 29th. Winter rye was growing well.—*T. S. Outram.*

Mississippi.—Frequent and heavy rains caused late cotton to open slowly and hindered picking; there was some rotting and sprouting of bolls, especially west, where worms were also damaging; at the close of the month picking was about completed east and south and well advanced elsewhere, with yield below average. The bulk of the corn crop was gathered, the yield being poor to fair. The cane crop was unusually promising and cutting and grinding were commenced. Irish and sweet potatoes did well.—*W. S. Belden.*

Missouri.—The first ten days of the month were clear and pleasant, but the second and third decades were cool and wet, heavy rains falling on the 16th, 17th, and 18th. First killing frost occurred on the 12th, and killing frosts were general over the State on the 20th–21st. Weather not favorable for drying out corn; 85 per cent still in fields; much rotting on ground and molding in shock. Wheat and rye seeding completed before wet weather set in; early sown up and showing green; no insects. Pastures excellent.—*George Reeder.*

Montana.—During the abnormally cold period of the 17th to 20th the temperature fell to zero or below in many places and to 10° or below over the entire State. Some apples still in the orchards and potatoes and cabbage in the fields were frozen, the loss being considerable in certain localities. As a rule, cattle and sheep promised to enter the winter in good condition. Early sown wheat came up and looked thrifty, but much late sown was not expected to germinate till spring.—*R. F. Young.*

Nebraska.—Corn fully matured without damage by frost. The quality was excellent and yield above average. Husking was progressing nicely the last week of the month. The bulk of the winter wheat was sown rather later than usual and under most favorable conditions. The acreage was large and the wheat came up in fine condition. Pastures and ranges were exceptionally good throughout the month and all stock was in fine condition.—*G. A. Loveland.*

Nevada.—The temperature and precipitation were much below normal. Cold weather damaged apples and potatoes that were not harvested. Hay and grain harvests were completed, with good yields of excellent quality. Plowing progressed and some grain was seeded, but farm work was retarded by dry weather. The late honey crop was good and several carloads were shipped to outside points. Large shipments of beef cattle and sheep were made.—*H. F. Alps.*

New England.—The weather was remarkably pleasant, with a preponderance of clear days The average precipitation, 1.68 inches, was the smallest of record for October, with two exceptions, namely, 1.50 inches in 1892, and 1.10 inches in 1897. Water in streams and lakes was low and in some northern sections the soil was very dry. The weather was exceptionally favorable for fall plowing and seeding, gathering and housing crops, and all other farm operations.—*J. W. Smith.*

New Jersey.—The month was exceptionally favorable for farm work and all late crops were gathered in good condition. Killing frost was general on the 22d, but did little damage. Wheat, rye, and grass attained good stands, except in a limited area in the northern portion, where the fly had done some injury to wheat. Corn husking was well advanced. Pasturage was good and cattle were still grazing.—*Edward W. McGann.*

New Mexico.—October was a very dry month over the greater part of the Territory, but the water supply, as a rule, was fair. Some snow occurred over the higher ranges from the 17th to 23d and frost touched all but the far southern valleys. Harvesting was finished some weeks since, with good yields generally. Range grasses cured well, and, with much hay and fodder, abundance of winter feed was assured. Stock of all kinds was in prime condition.—*Charles E. Linney.*

New York.—October was a fine fall month, with generally moderate temperature and sufficient rainfall. The first general killing frost occurred on the 26th, but did no material damage, as all crops liable to injury had been secured. There were a few potatoes to be dug and some corn to be husked at the end of the month, but all other crops were housed in good condition. Wheat and rye looked fine and seemed to be in excellent condition for the winter.—*H. B. Hersey.*

North Carolina.—Weather favorable for gathering all crops. Good yields of Irish potatoes, peanuts, and sweet potatoes were secured. Cotton picking advanced rapidly, and at the close of the month four-fifths of the crop had been picked. The greater part of the corn crop had also been gathered. The temperature was normal, and the rainfall was 1.21 inches below the normal. The droughty condition prevented plowing and the sowing of small grains. Light to killing frosts occurred, but did no damage to staple products.—*A. H. Thiessen.*

North Dakota.—The month was very favorable for finishing thrashing, being generally dry and cool, and much of this work, which was delayed last month from various causes, was done. Practically all the grain had been thrashed by the end of the month, although in some localities a little was left. Considerable fall plowing was done in the eastern part of the State, but in the central and western portions this work made very little progress on account of the ground being too dry.—*B. H. Bronson.*

Ohio.—The weather was generally favorable for farm work. Killing frosts occurred during the last part of the month. Corn husking had progressed well, but there was some complaint of moldy and damaged grain. Winter rye and wheat started quickly and made unusually good progress. Potatoes yielded from fair to good. Tobacco was all housed and considerable stripping accomplished.—*J. Warren Smith.*

Oklahoma and Indian Territories.—The temperature was below normal. The rainfall was normal, although unevenly distributed. Cotton deteriorated, owing to hail and high winds, locally, and to general freezing temperatures on the 20th and 21st, which killed the plant; picking was from one-third to wholly completed; yields poor to good; lint good. Corn was fair to good, and was being cribbed. Wheat seeding nearing completion; where up the crop was doing well. Good crops of kaffir corn, millet, cane, hay, and alfalfa were secured. Sweet and Irish potatoes good. Pastures drying up, but stock in good condition.—*Edward B. Richards.*

Oregon.—The rainfall put the ground in good plowing condition, except in southern sections, and a large amount of fall plowing and seeding was done. The cool, frosty weather of the latter half of the month retarded germination and checked the growth of fall pasturage, but both dairy and range stock, generally, kept in good condition. Potato digging was completed; the crop was about average in quantity and above average in quality. The apple yield was about half of a full crop and rather inferior in quality.—*Edward A. Beals.*

Pennsylvania.—Weather favorable. Soil in excellent condition for farming operations. Crops secured in good condition. Wheat and rye well set, thrifty, and of good color, very few reports of fly. Corn husking well advanced, yield large. Pasturage good. Killing frost was reported at numerous stations on the 22d.—*T. F. Townsend.*

Porto Rico.—The wet weather of the month was very favorable for cane, and the sugar prospect continued excellent. Tobacco planting was in active progress during the latter half of the month. Coffee picking and drying continued; yield above the average in quantity and quality. New oranges became plentiful during the latter portion of the month. A scarcity of minor crops was noted in many localities.—*E. C. Thompson.*

South Carolina.—Temperatures were slightly above normal. Precipitation was deficient. There were two periods with light to killing frosts. The weather favored the development of late cotton and permitted the practical completion of picking and the saving of the lint in perfect condition; also the gathering of dry and fully ripened corn and the securing of a large crop of well cured peavine hay. The deficient precipitation delayed fall plowing and seeding operations. It was too dry for root crops and fall truck.—*J. W. Bauer.*

South Dakota.—Month cooler and wetter than usual. Rain and snow retarded thrashing and slightly injured some poorly stacked grain and bunched flax and hay, but aided plowing. Corn promised an unusually good yield, but was drying out slowly. Range grass was in fine condition and live stock did nicely. At the close of the month thrashing was not yet completed, plowing was backward, the harvesting of a fair crop of potatoes was nearly finished, the cribbing of corn had begun, and the condition of winter grains was very satisfactory.—*S. W. Glenn.*

Tennessee.—Heavy rainfall injured corn and cotton in the fields and hindered the gathering of these crops, the seeding of wheat, and other farm work. The abundant moisture was favorable to the germination and growth of winter grains. A large proportion of the cotton crop had

SUMMARY OF TEMPERATURE AND PRECIPITATION BY SECTIONS, OCTOBER, 1905.

In the following table are given, for the various sections of the Climate and Crop Service of the Weather Bureau, the average temperature and rainfall, the stations reporting the highest and lowest temperatures with dates of occurrence, the stations reporting greatest and least monthly precipitation, and other data, as indicated by the several headings.

The mean temperatures for each section, the highest and lowest temperatures, the average precipitation, and the greatest and least monthly amounts are found by using all trustworthy records available.

The mean departures from normal temperature and precipitation are based only on records from stations that have ten or more years of observation. Of course the number of such records is smaller than the total number of stations.

Section.	Temperature—in degrees Fahrenheit.							Precipitation—in inches and hundredths.					
	Section average.	Departure from the normal.	Monthly extremes.					Section average.	Departure from the normal.	Greatest monthly.		Least monthly.	
			Station.	Highest.	Date.	Station.	Lowest.	Date.			Station.	Amount.	Station.	Amount.
Alabama	64.1	0.0	Wetumpka	91	2	Anniston	29	21	4.39	+2.16	Madison	8.33	Letohatchee	0.97
Arizona	64.2	0.0	Aztec	116	3	Fort Defiance	10	20	0.23	−0.55	Alpine	1.03	15 stations	0.00
Arkansas	61.1	− 0.9	Des Arck, Newport	92	7	Pond	23	21	4.49	+1.98	Dallas	8.31	Elon	1.57
California	60.7	− 0.2	Imperial	107	6, 7	Bodie	− 3	17	0.12	−1.37	Monumental	5.16	Many stations	0.00
Colorado	44.3	− 2.9	Lamar	97	7	Ft. Collins, Greeley	− 8	31	0.82	−0.06	Cardinal	4.50	2 stations	0.00
Florida	73.2	+ 0.4	Flamingo, Molino	96	28, 6	Marianna	35	13	2.96	−1.13	Fernandina	10.56	Stephensville	0.15
Georgia	64.6	+ 0.6	Fleming	98	20	Millen, Point Peter	30	22, 23	2.85	−0.02	St. Marys	8.31	Dublin	0.54
Hawaii	73.3	.....	Kihei Maui	93	18	Humuula, Hawaii	36	26	5.79	.....	Hakalau, Hawaii	22.10	Kihei, Maui	0.02
Idaho	42.4	.....	Garnet, Glenns Ferry	89	3 d'ts, 3	Forney	− 3	19	1.44	.....	Kellogg	5.95	3 stations	0.00
Illinois	54.0	− 0.9	Benton, Flora	96	5, 3	Lanark, Zion	16	29	4.11	+1.80	Hillsboro	10.32	Monmouth	1.56
Indiana	54.1	− 0.6	Columbus	91	8	Bluffton	20	30	4.85	+2.51	Washington	9.39	South Bend	1.25
Iowa	49.2	− 3.3	Inwood, Sheldon	94	4	4 stations	16	28–30	3.40	+0.98	Iowa City	5.36	Sioux Center	1.20
Kansas	54.0	− 3.8	Alton, Coffeyville	93	4, 5, 9	Colby	8	20	1.88	−0.08	Oswego	7.68	Lakin	0.06
Kentucky	57.0	− 0.9	Beaverdam, Hopkinsville	90	1, 7	Farmers, Shelby City	25	23, 22	4.95	+2.66	Alpha	8.00	Beaverdam	2.80
Louisiana	68.1	+ 0.7	Alexandria	94	2	3 stations	33	21, 22	4.36	+1.72	Houma	11.62	Lake Charles	0.08
Maryland and Delaware	56.6	+ 1.1	Boettcherville, Md., Coleman, Md	93	1, 5, 2	Deer Park, Md	20	29	2.77	−0.33	Bachmans Valley, Md	5.75	Porto Bello, Md	1.10
Michigan	48.8	+ 0.4	Allegan	91	8, 9	Humboldt	− 3	29	2.92	+0.04	Holland	5.77	Cheboygan	0.50
Minnesota	43.5	− 2.6	3 stations	90	3 dates	Hallock, Mount Iron	4	28, 29	2.50	+0.21	Albert Lea	4.05	Hallock	0.20
Mississippi	64.6	+ 0.2	Crystal Springs	94	2	Shelby	30	22	4.46	+2.61	Jackson	9.58	Fayette (near)	1.36
Missouri	55.1	− 2.3	Caruthersville	90	7	Unionville	20	28	4.64	+2.33	Versailles	10.81	Gallatin	1.24
Montana	39.9	− 5.2	Lewistown	92	4	Wolsey	−12	19	0.96	+0.06	Troy	4.28	Ridgelawn	0.00
Nebraska	47.9	− 3.6	Lynch	96	4	Kimball	4	30	1.23	−0.35	Seward	4.15	2 stations	0.10
Nevada	45.8	− 3.2	Battle Mountain	96	1, 4	San Jacinto	0	19	0.05	−0.51	Tecoma	0.40	20 stations	0.00
New England*	49.3	− 0.2	Torrington, Conn	85	1	Van Buren, Me	10	27, 31	1.68	−2.12	Jacksonville, Vt	3.63	Fairfield, Me	0.38
New Jersey	55.5	− 1.2	Indian Mills	90	1	Layton	17	27, 30	2.71	−0.95	Newton	4.83	Woodbine	0.75
New Mexico	53.0	− 0.7	Lordsburg, San Marcial	91	5, 4	Rociada	6	20	0.39	−0.52	Fort Union	1.54	2 stations	0.00
New York	50.1	+ 1.1	Straits Corners	94	1	North Lake	10	26, 30	3.41	+0.31	2 stations	7.00	Carvers Falls	1.26
North Carolina	59.8	0.0	Kingston, Lumberton	92	3, 5, 2	Linnville, Pink Beds	16	21, 22	2.40	−1.21	Horse Cove	6.07	Charlotte	0.70
North Dakota	40.3	− 2.0	Jamestown	93	6	Edmore, Walhalla	0	28	0.44	−0.74	Wahpeton	1.57	8 stations	T.
Ohio	52.6	− 0.7	Findlay	89	8	6 stations	20	30, 31	3.63	+1.39	Marietta	6.96	Toledo	1.10
Oklahoma and Indian Territories.	60.0	− 2.3	Goodwater, Ind. T.	96	1	Gage, Okla., Kenton, Okla	20	19, 20	2.71	−0.11	Goodwater, Ind. T.	9.82	Kenton, Okla	0.25
Oregon	48.0	− 3.1	Klamath Falls	92	3	Silver Lake	9	18, 31	3.73	+1.03	Glenora	11.65	2 stations	0.00
Pennsylvania	53.2	+ 1.6	5 stations	90	1	Pocono Lake	16	30	4.23	+1.14	Hamburg	7.06	Lawrenceville	2.18
Porto Rico	78.4	.....	Vieques	99	16, 21	Adjuntas	55	3 dates	12.64	.....	La Carmelita (B)	22.29	Ponce	4.70
South Carolina	64.2	+ 0.7	Blackville	93	2	Seivern	29	22	1.97	−1.16	Liberty	5.20	St. George	0.60
South Dakota	45.0	− 4.0	Mellette	96	6	White Horse	− 1	20	1.97	+0.74	Fort Meade	4.95	Pine Ridge	0.60
Tennessee	59.8	+ 1.1	5 stations	90	4 dates	Rugby	22	22	5.32	+3.24	Bolivar	11.95	Elizabethton	2.54
Texas	67.4	− 0.7	Fort Ringgold	104	1	Hale Center	26	20	2.61	+0.27	Arthur City	12.24	Hale Center	0.00
Utah	45.4	− 4.1	Grayson	99	8, 17	Plateau	0	19	0.36	−0.63	Alta	1.39	5 stations	0.00
Virginia	56.9	− 0.5	Woodstock	93	1	Burkes Garden	15	22	2.54	−0.68	Speers Ferry	4.24	Ashland	0.66
Washington	45.6	− 4.0	Touchet, Zindel	83	3, 4	4 stations	11	18, 31	3.87	+1.49	Aberdeen	11.60	Wahluke	0.40
West Virginia	54.2	+ 0.1	Moorefield	93	9	Bayard, Durbin	19	22	4.71	+2.59	Cairo	8.26	Green Sulphur Sp'g's	2.52
Wisconsin	46.4	− 1.9	Koepenick	90	3	Hayward	4	29	2.79	−0.26	Sturgeon Bay	5.08	Medford	1.30
Wyoming	37.7	− 4.7	Lusk	90	5	South Pass City	− 9	19	1.02	+0.09	Moorcroft	2.27	Alcova	T.

* Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut. † 46 stations, with an average elevation of 662 feet. ‡ 133 stations.

been picked by the end of the month. Killing frosts occurred on the 22d.—*Roscoe Nunn.*

Texas.—Rainfall deficient, except in central, western, and northeastern districts, where heavy showers fell. Temperatures averaged slightly below normal. Cotton picking progressed rapidly, with generally favorable weather, although there was some delay by rain, and was practically completed south. Some damage resulted from storms, but practically none from frost. Boll weevils increased in numbers. Showers improved conditions for seeding grain, grain already up, and pastures, and increased supply of stock water. Stock did well. Gardening in coast counties delayed. Rice and sugar cane harvest progressed favorably.—*M. E. Blystone.*

Utah.—The weather during the month was abnormally cool and dry. Plowing and seeding generally made rapid headway, although in some localities this work was impeded by the dry condition of the soil. Early sown wheat was coming up in good condition. Thrashing and beet digging were nearing completion. Potatoes and apples were badly damaged by frost. The range, though dry in localities, afforded ample sustenance to stock, which was in good condition.—*R. J. Hyatt.*

Virginia.—Although precipitation during the month was below normal, conditions were generally favorable for work and considerable progress was made in late plowing and seeding and the housing of crops. Late seeded wheat and oats germinated quite well, as a rule, and the fields sown early in the fall made good growth. Pastures were somewhat short throughout the month.—*Edward A. Evans.*

Washington.—The first half of the month was excessively rainy, particularly the first week, and thrashing of wheat and oats in late sections was hindered and grain damaged by wetting in shocks. Potato digging, plowing, and fall sowing were delayed. Severe frosts in the latter half of the month killed late vegetables. High winds blew apples from trees and injured orchards. Winter wheat sown before the rains came up well, but subsequent cold weather made growth slow.—*G. N. Salisbury.*

West Virginia.—The weather during the month was favorable for farm work and germination. Killing frost occurred quite generally on the 13th. Pastures held up well and stock was in very good condition. Corn, buckwheat, cabbages, and turnips made good yields. Crops were all gathered and corn husking was in progress. Wheat, rye, and winter oats were all sown and growing nicely. Quite a large acreage of wheat was sown.—*E. C. Vose.*

Wisconsin.—A severe storm passed over the State on the 18th and 19th, causing heavy rains in the southern counties and snow in the central and northern sections, but for the remainder of the month the

weather was generally pleasant. The freezing weather toward the end of the month caused some damage to potatoes that were in the ground. Farm work was well advanced and winter wheat and rye and clover were in good condition.—*W. M. Wilson.*

Wyoming.—The first week of the month was favorable for securing crops and for the completion of thrashing. The severe freeze of the 19th–20th destroyed some potatoes and other vegetables that had not been taken from the ground. While the month was cool and precipitation over much of the State above the normal, no severe storm occurred, and stock interests suffered but very little. The storms of the month gave good quantities of snow in the mountains of the State.—*W. S. Palmer.*

SPECIAL ARTICLES.

THE ZIEGLER RELIEF EXPEDITION.

By Dr. O. L. FASSIG. Dated Mount Weather Observatory, Bluemont, Va., October 25, 1905.

I left Baltimore on the morning of May 1, reaching New York about 3 p. m. of the same day. On May 3 I left New York on the White Star liner *Teutonic* in company with Mr. W. S. Champ, representative of the late William Ziegler and leader of the relief expedition. Mr. Champ's destination was a designated island of the group known as Franz Josef Land; my objective point was the northeast coast of Greenland, more particularly Bass Rock and Shannon Island, where stores had been laid down in 1903 for the use of an earlier exploring party in case any of the members should return by this route.

The steam sealer *Magdalena*, chartered by Mr. Champ for the Greenland journey, left Sandefjord, Norway, on June 21, 1905. I was the only representative of the late Mr. Ziegler to accompany the captain and crew of the *Magdalena*, and in fact the only passenger. The instructions were: (1) To proceed to Bass Rock and Shannon Island. (2) To bring back any members of the Ziegler Arctic Expedition of 1903 who might be found there. (3) To inspect the stores and storehouses found there. After leaving Sandefjord, Norway, we proceeded directly to Bass Rock and Shannon Island without making any intermediate ports. We reached the floating ice on July 10, in latitude about 72° north and 5° west of Greenwich. After considerable difficulty we forced our way through the ice and fog to the coast of Greenland, reaching Bass Rock (lat. 74° 46′ N., long. 18° 12′ W.) on the morning of July 21, and Shannon Island (about twenty miles northward) on the afternoon of the same day. After convincing ourselves that no members of the Ziegler party had been on these islands, and finding the stores and storehouses in good condition, we started on our return journey in the evening of the same day (July 21).

Returning by a southeasterly course we passed beyond the influence of the ice in the neighborhood of Jan Mayen Islands, very near the point at which we first met the floating ice. During the entire period, from July 1 to 27, foggy weather prevailed, and on all but two days of this period the fog was dense most of the day. This impeded our progress and added greatly to the difficulties and dangers of our journey, especially during the two weeks or more of our movements in the ice fields.

We reached Miofjord, Iceland, on August 1, where I left the *Magdalena* and took passage in the Danish steamer *Kong Inge* for Leith, Scotland, arriving at the latter port on the 7th of August. On the 10th of August I received a cable from Mr. Champ announcing that he had returned to Norway with practically the entire Ziegler party. On August 12 I left London and Southampton, taking passage on the American liner *Philadelphia* for New York, arriving on the 19th. I left New York on August 21 arriving in Baltimore on the evening of the same day.

A more detailed narrative of my journey is being prepared for publication by Mr. Champ.

STANDING CLOUDS AMONG THE NORTH CAROLINA MOUNTAINS.

By FRANK W. PROCTOR. Dated Fairhaven, Mass., November 8, 1905.

In Science, May 1, 1903, Prof. R. DeC. Ward, speaking of an account of a standing cloud observed in the mountainous region of North Carolina by Professor Davis (Bulletin of the Geographic Society of Philadelphia, Pa., III, No 3, 1903), says: "This is the first mention of the occurrance of helm clouds in this section."

If this means single standing clouds, it is probable that they have not been reported before, because they are seen so often. At Waynesville, N. C., they are of common occurrence. This village is surrounded on three sides by high and steep mountains, and, therefore, the topography is very favorable for the formation of dynamic clouds. The following account of an interesting standing cloud showing two wave crests, observed at Waynesville by the writer, is taken from a memorandum made at the time:

December 17, 1897.—Barometer high, wind southwest. Large, dense, standing cloud over Caney Fork Bald, and the Richland Balsam Range, cumulus form, carried down on lee side a short distance, and evaporating at its leeward edge as fast as it forms to windward. A short distance to leeward, perhaps one-fourth to one-half a mile, approximately at the same level, and separated from the main cloud by an entirely clear space, is a detached, standing, fracto-cumulus of good size, forming to windward and evaporating to leeward like the primary cloud. The sky over the valley is otherwise clear.

This mountain range forms the head of the valley, and runs athwart the direction of the wind that is blowing down the valley. Just across the narrow Balsam Gap, another ridge of mountains runs at right angles, forming one side of the valley. The wind meets this range at a small angle with the axis of the ridge, and the small component of motion up the slope forms a dynamic cloud, which driven by the main component, drifts along the summit of the ridge in a continuous, thin, strato-cumulus sheet, about eight miles long, and finally evaporates and disappears as the ridge descends to the valley. There are no other clouds in sight.

This long cloud sheet is at substantially the same level as the double standing cloud over the Richland Range, and the portion abreast the observer, shows by its motion that the wind at the level of the standing cloud must be blowing twenty miles an hour, probably more, yet that cloud is stationary, and so is the detached, secondary, standing cloud directly to leeward.

It may be added to the foregoing quotation, that on the sides of the mountains facing the valley, what might be called dynamic fog, is frequent. That is to say, after rains, or when there is much dampness, the wind blowing up these mountain sides, forms fog sheets on the windward slopes, when no fog is to be seen in any other direction.

A narrow, deep, and steep ravine between the main ridge last mentioned above, and a lateral spur, frequently has a fog cloud at its head, like that described by Mr. Eddy, in the MONTHLY WEATHER REVIEW, for December, 1904, and which he attributed to mixture. Here it is evidently of dynamic origin.

On two occasions the writer observed cumulus clouds crossing the valley, which were rotating on horizontal axes, similar to those mentioned by Mr. Eddy in the same article. The rotatory motion was supposed to be caused by the curling of the wind over the summit of the mountain ridge whose axis lay at right-angles to the direction of the wind.

SOUNDING AND PILOT BALLOONS OVER THE OCEAN.

By H. S. H., the Prince of Monaco.

[Translated from Comptes Rendus de l'Académie des Sciences, Tome 141, No. 11, September 11, 1905.]

Following the experiments made at Monaco and in the region of the trades for the exploration of the upper atmosphere by means of kites, I undertook, at the suggestion of Professor Hergesell, of Strassburg, to apply to these researches the method of sounding balloons already employed with great success on land. These experiments took place on

the Mediterranean in April and on the ocean in July and August, 1905.

The results obtained have confirmed our expectations and the object of the present note is to describe the method employed.

The following is the principle on which rest the launchings of sounding balloons—a principle due to Professor Hergesell:

Two india rubber balloons, unequally inflated, carry the recording instrument and a float; at an elevation fixed, with sufficient approximation in advance, one of the balloons bursts and the entire system falls until the float and the débris of the balloon have reached the surface of the sea. The second balloon carrying the instrument then hangs above the water at an elevation of about 50 meters and serves as a guide to the vessel which has constantly followed the balloon.

In case it is desired to limit the ascension to an elevation absolutely fixed, the balloon is automatically freed by means of disengaging gear operated by an electromagnet, which is actuated by a dry battery, the circuit of which is closed by the pen of the barograph when it indicates the elevation selected.

The use of either of the methods described results in giving, only for the period of the ascension, with the aid of a register, the elevation, temperature, and humidity. But these data do not suffice to give a complete knowledge of the condition of the atmosphere. To complete them it is necessary to study at different periods in the ascent the direction and velocity of the air currents. To this end the vessel follows as exactly as possible the direction taken by the balloons, while two observers on board take at fixed intervals the azimuths and angular elevation of the system. The route and the speed of the vessel being known, a simple geometrical construction enables one to trace the horizontal projection of the trajectory followed by the balloons, a projection which determines for each moment the direction and force of the air currents.

But the application of this method requires that the balloons be constantly visible from the moment of departure until the moment of their fall into the water. In the frequent case where the second balloon becomes invisible after the bursting of the first, and especially in the lower layers of the atmosphere, Ensign Sauerwein has devised a very simple method for finding the point of descent.

The course of the ship being traced in distance and direction, on any scale, upon a chart, the point of descent, if the condition of the atmosphere has not changed, is measurable from the point of departure by reference to the horizontal projection of the point of bursting, calculated according to the vertical speed of the system. It is sufficient, therefore, as soon as the balloon is lost to view, to sail to the point thus determined.

If the investigation is limited to the direction and velocity of the air currents, it is sufficient, according to the method of Professor Hergesell, to launch an india rubber pilot balloon, the trajectory of which is determined, similarly, by sighting, the elevation being deduced from the vertical velocity, which is a function of the ascensional force, following a formula established by preliminary experiment.

By means of this method there have been made on board the yacht *Princesse Alice* 26 ascensions, eight in the Mediterranean and eighteen in the region in and north of the trades. The maximum elevation attained was 14,000 meters above the Atlantic; and several balloons have exceeded 12,000 meters. The results of these ascensions and of the kite ascensions made in 1904–5 will form the subject of a publication by Professor Hergesell.

WEATHER BUREAU CIPHER CODES.

By Prof. E. B. GARRIOTT.

The first cipher code used by our Government weather service for the telegraphic transmission of meteorological observations consisted of lines of figures that indicated the readings of the various instruments, and denoted, by series of numbers, the names of stations of observation, the direction and force of the wind, state of the weather, and the kind and amount of clouds. Twenty figures were employed to send the morning, and ten figures to send each afternoon and night observation, the figures for clouds, relative humidity, and rainfall being omitted in the afternoon and night reports. A calm and an absence of upper or lower clouds was indicated by the word "naught", and the word "blank" was used to indicate that upper or lower clouds were hidden, the words in each case being entered in the places assigned to the figures that ordinarily represented these elements.

In 1871 a cipher code[1] was adopted by means of which a full report was transmitted in ten words. By this system one word was used for the name of the station, and one each to encipher the height of the barometer, air temperature, relative humidity, wind velocity, rainfall, and day of the month and time of the observation, one for the direction of the wind and the state of the weather, and one for the kind, amount, and direction of movement of the upper, and lower, clouds, respectively. The code also contained words for reporting river stages.

During the succeeding seventeen years various changes were made in the code, the most important of which provided for a separate set of barometer words for the three daily reports, the words for the morning, afternoon, and night reports beginning with M, E, and N, respectively. During the entire period, however, the code words were arbitrarily selected and an expeditious deciphering of the data required that a large number of words, and their equivalents, should be memorized.

The code used since 1887 was devised by Gen. A. W. Greely, and by its use an average of six words is required to transmit a report of a meteorological observation. The code is known as a "key" code, and has for a base the consonants b, d, f, g, m, n, r, s, t, representing 10, 20, 30, 40, 50, 60, 70, 80, and 90, respectively, and the vowels a, e, i, o, and u or y, representing 2, 4, 6, 8, and 0, respectively. The consonants b to s are also used to indicate the eight directions of the wind beginning with b for north, d for northeast, etc., and the vowels also indicate the condition of the weather, a indicating fair, e cloudy, i rain, o snow, and u or y clear. Each syllable of the words of this code represents by the first consonant and the following vowel one or more meteorological elements. The meaning of a word depends upon its place in the message. Thus the first code word after the name of the station gives the pressure and temperature. The word "seldom", for instance, when written as the first code word of a message, indicates the height of the barometer and the temperature of the air; the first consonant with the first vowel, s and e, represent 84 for the barometer; the second consonant with the vowel following in the second syllable, d and o, represent 28, for the temperature. The height of the barometer, to the nearest whole inch, is, as a rule, apparent from the readings on the last map or at surrounding stations of observation. In another position in the message the first syllable of the word would indicate the direction of the wind and the state of the weather, e. g., s indicating northwest, and e cloudy, and the second syllable would indicate the reading of the maximum thermometer, 28, as shown by the letters d and o.

Adaptations of this code have been employed in transmitting reports of the Weather Bureau River and Flood Service, in telegraphing weather reports for the Climate and Crop Service, and in cabling reports from the West Indies, Europe, and some islands of the Atlantic. The latest adaptation provides for a transmission to Washington of reports received by wireless telegraph from vessels at sea, and furnishes in four or five words the position, in degrees of latitude and longitude, of a

[1] Modelled after the cipher code printed in 1869 for use by the Cincinnati observatory.—ED.

reporting vessel, and the essential data of a meteorological observation.

The particular advantage of the code is found in the rapidity with which it can be deciphered, and in the economical conduct of the great amount of Weather Bureau telegraphic business that its use permits. The first code required twenty words, the second ten words, and the present one six words for a report of a meteorological observation. In the beginning telegraphic rates were 6 to 9 cents a word for each circuit, they are now 2¼ to 4 cents a word. By the present cipher system and telegraphic rates the two daily reports now telegraphed cost less than one-half the amount that would be required to conduct the same service under the original system. Improvements in the cipher codes and reductions in telegraphic tolls have for years saved the Government more than $100,000 annually in the cost of the reports used in its weather forecast and storm warning service.

RECENT PAPERS BEARING ON METEOROLOGY.

C. FITZHUGH TALMAN, Acting Librarian.

The subjoined titles have been selected from the contents of the periodicals and serials recently received in the Library of the Weather Bureau. The titles selected are of papers or other communications bearing on meteorology or cognate branches of science. This is not a complete index of the meteorological contents of all the journals from which it has been compiled; it shows only the articles that appear to the compiler likely to be of particular interest in connection with the work of the Weather Bureau. Unsigned articles are indicated by a ——

Scientific American Supplement. New York. Vol. 60.

Smith, N. F. Note on filling a barometer tube. P. 24936.

Wixon, Howard W. Principles of soaring flight. P. 24904.

Transactions of the Canadian Institute. Toronto. Vol. 8.

Tully, Kivas. Fluctuations of Lake Ontario. [Precipitation, 1854–1903.]

Sunset. San Francisco. Vol. 15. Oct., 1905.

McAdie, Alexander [G.]. The Los Angeles rain-making. Pp. 575–577.

Aeronautical Journal. London. Vol. 9. Oct., 1905.

Reid, Walter F. Balloon varnishes and their defects. Pp. 64–68.

Walker, William George. Vertical screw aerial machine, with special notes on the lifting propellers. Pp. 57–64.

Wenham, F. H. Some remarks on aerial flight. Pp. 56–57.

Nature. London. Vol. 73.

S., W. N. Astronomy and meteorology in Australia. P. 8. Nov. 2, 1905.

Symons's Meteorological Magazine. London. Vol. 40. Oct., 1905.

Bonacina, L. C. W. Summary of the results of British thunderstorm committee (1888–89). Pp. 158–160.

Curtis, R. H. On the use of Beaufort's scale. Pp. 156–158 (continued from p. 140).

—— Nile floods and atmospheric pressure. [Abstract of paper by H. G. Lyons. Proc. roy. soc., vol. A 76, p. 66–86]. Pp. 164–165.

L'Aérophile. Paris. 13 année.

Goupil, A. Equilibre d'un cerf-volant de 1m² de surface, s'étant tenu à une position très voisine de la verticale du lieu de retenue. Oct., 1905. Pp. 226–227.

Annuaire de la Société Météorologique de France. Paris. 53 année.

Goutereau, Ch. Distribution des pluies sur les plaines maritimes. Sept., 1905. Pp. 206–209.

Lumen, Ch. Note sur deux orages. Sept., 1905. Pp. 202–206.

Moureaux, Th. Trombe du 28 août 1905 à Saint-Maur et à Champigny (Seine). Sept., 1905. Pp. 201–202.

—— Distribution des gouttes de différentes grosseurs dans les chutes de pluie. Sept., 1905. P. 215.

—— Les plus basses températures observées dans l'atmosphère. Sept., 1905. P. 216.

—— Observations météorologiques faites pendant l'éclipse de soleil du 30 août 1905. Oct., 1905. Pp. 218–230.

—— Température dans les cyclones et les anticyclones. [Abstract of paper by H. H. Clayton in Beiträge zur Physik der freien Atmosphäre.] Sept., 1905. Pp. 212–214.

Archives des Sciences Physiques et Naturelles. Genève. 4 Période. Tome 20. Oct., 1905.

Brückner, Ed. Sur le bilan du cycle de l'eau sur la terre. Pp. 427–430.

Dufour, Henri. Résultats actinométriques observés au dessus de Lausanne pendant l'éclipse partielle du 30 août. Pp. 434–435.

Gautier, R. Résumé météorologique de l'année 1904 pour Genève et le grand Saint Bernard. Pp. 386–411.

Gockel, A. Observations sur l'électricité atmosphérique pendant l'éclipse totale de soleil du 30 août 1905. Pp. 433–434.

Pictet, Raoul. Phénomène de convection du gaz apparu accidentellement dans ses expériences de Berlin. Pp. 432–433.

Saussure, Renéde. Projet de bureau météorologique central européen. Pp. 414–418.

Ciel et Terre. Bruxelles. 26 année.

L., V. D. Froid dans la haute atmosphère. Oct. 1, 1905. Pp. 374–375.

Lagrange, E. Cyclone de Sedan du 9 août 1905. Oct. 16, 1905. Pp. 384–390.

Lancaster, A. [Ed.]. Éclipse totale de soleil du 30 août 1905. [Continued.] Oct. 1, Oct. 16, Nov. 1, 1905. Pp. 355–368, 379–384, 403–419.

—— Mouvements généraux de l'atmosphère en hiver. [Pressure distribution in the northern hemisphere. Abstract of paper by P. Garrigou-Lagrange, Compt. rend. ac. sc., Par., July 24, 1905.] Oct. 16, 1905. Pp. 397–400.

—— Salinité et la température des eaux de mer. [Abstract of paper by L. Laloy in La Nature.] Oct. 16, 1905. P. 397–400.

Comptes Rendus de l'Académie des Sciences. Paris. Tome 141. 1905.

Bigourdan, G. Résumé des observations de l'éclipse totale de soleil du 29–30 août 1905 faites à Sfax (Tunisie) Oct. 2. Pp. 541–546.

Brunhes, Bernard and Baldit, Albert. Sur la dissymétrie de la déperdition électrique en pays de montagne; rôles comparés de l'altitude et du relief. Oct. 30. Pp. 693–695.

Janssen, J. Sur la creation d'une association internationale pour les études solaires. Oct 9. Pp. 572–573.

Rotch, A. Lawrence, and Teisserenc de Bort, Leon. Sur les preuves directes de l'existence du contre-alizé. Oct. 9. Pp. 605–608.

Éclairage Électrique. Tome 44.

Breydel, A. Appareils pour dissiper les brouillards et fumées. Pp. 441–442.

La Nature. Paris. 33 année. 1905.

Tardieu, Gustave. Observatoire météorologique du Mont Ventoux. Oct. 21. Pp. 332–334.

Villedeuil, Ch. de. Existence du contre-alizé au sud des Açores. Oct. 14. P. 319.

—— Concours international de prévision du temps. [Liege, Sept., 1905.] Oct. 21. P. 327.

Le Temps qu'il Fait. Mons. 2 année. Sept.-Oct., 1905.

Bracke, A. Arc-en-ciel sextuple. P. 167.

Quignon, G. Éclipse de soleil du 30 août. Pp. 192–196.

Roy, Felix de. Une ascension scientifique. Pp. 161–166.

Touchet, Emile. Photographie des éclairs. [Reprinted from Bull. soc. astrom. de France.] Pp. 168–187.

Hemel en Dampkring. Den Haag. 3 Jaargang. Oct., 1905.

Nell, Chr A. C. De Halo's. Pp. 82–87. Continued from p. 72.

Annalen der Hydrographie und Maritimen Meteorologie. Berlin. 33 Jahrgang. Heft 10.

Hambruch, Paul. Eisverhältnisse auf der Unterelbe. Pp. 435–454.

Meteorologische Zeitschrift. Wien. Band 22. Sept., 1905.

H[ann], J[ulius]. Meteorologische Windrosen für die Kapstadt. P. 415.

Janezic, E. Beobachtung einer Wolkenrolle. Pp. 413–414.

Johansson, Osk. V. E. Cederström über die Anemometerprüfungsmethoden. Pp. 418–420.

Linsbauer, K. Lichtklima in seiner Bedeutung für die Pflanzenphysiologie nach Wiesner. Pp. 420–423.

Meinardus, W. Ueber die Windverhältnisse an der Winterstation des "Gauss". Pp. 424–427.

Meinardus, Wilhelm. Ueber Schwankungen der nordatlantischen Zirkulation und damit zusammenhängende Erscheinungen. Pp. 398–412.

Osthoff, H. Formen der Cirruswolken. Pp. 385–398.

Schlein, Anton. Wiener Hochfahrt vom 2 August und vom 6 September 1905. Pp. 427–430.

—— Meteorologische Beobachtungen 1904 zu Moose Factory an der Hudsonbai. P. 431.

—— Resultate der meteorologischen Beobachtungen zu Weihaiwei in den Jahren 1899–1904, inkl. P. 423–424.

—— Resultate meteorologischer Beobachtungen in den Kapstadt und am Tafelberge in Jahre 1903. P. 416.

—— Ueber die Schwankungen des Kohlensäures-gehaltes der Luft in Kew während der Jahre 1898–1901. Pp. 414–415.

—— Ueber einige zusammenhängende Beobachtungsreihen des Betrages der elektrischen Zerstreuung in freier Luft von Dr. C. Coleridge-Farr. [Abstract from Nature, May, 1905, p. 94.] Pp. 416–417.

—— Eredia über die Inversion der Temperatur zwischen Rocca di Papa und Monte Cavo. 1893–1899. Pp. 430–431.

Naturwissenschaftliche Rundschau. Berlin. 20 Jahrgang. Nov. 2, 1905.

Studien über die Wolken. Höhen, Bewegungen und Struktur der Wolken auf dem Pic du Midi (Pyrenäen) (S. Marchand). [Abstract from Jahresbericht des Sonnblickvereins 1904, p. 8–17.] P. 563.

Petermanns Mitteilungen. Gotha. Band 51. Heft 8.

Polis, P. Wolkenbruchartigen Regenfälle am 17 Juni im Mass-, Rhein- und Wesergebiet. Pp. 193–197.

Physikalische Zeitschrift. Leipzig. 6 Jahrgang, 1905.

Denizot, A. Theorie der relativen Bewegung und ihre Anwendung auf Bewegungen auf der Erdoberfläche. Pp. 677–680. Oct. 15.

Ebert, H. Ionenzählungen bei Gelegenheit der totalen Sonnenfinsternis am 30 august 1905. Pp. 641–647. Oct. 15.

Gerdien, H. Elektrizitätshaushalt der Erde und der unteren Schichten der Atmosphäre. Pp. 647–666. Oct. 15.

Occhialini, Augusto. Dielektrizitätskonstante der Luft in ihre Beziehung zu ihre Dichte. Pp. 669–672. Oct. 15.

Papers from the First International Congress for the study of Radiology and Ionisation, Liege, Sept. 11–16, 1905:

Barus, Carl. Eigenschaften von Kondensationskernen und ihre atmosphärische Verteilung. (Translated by Alfred Gradenwitz.) Pp. 718–726.

Brunhes, Bernard and Baldit, Albert. Ueber die Zerstreuung der beiden Elektrizitäten auf dem Gipfel und im Gebiet des Puy de Dôme. [Translated by Max Iklé.] Pp. 715–718. Oct. 26.

Sarasin, Ed. Ueber die Radioaktivität der Luft, welche atmenden Brunnen entströmt. Pp. 708–709. Oct. 26.

Das Wetter. Berlin. 22 Jahrgang. Oct., 1905.

Assmann, [Richard]. Internationale Konferenz von Direktoren meteorologischer Institute in Innsbruck. Pp. 233–236.

Assmann, Jul. Gewitterhäufigkeit in Lüdenscheid und Arnsberg. Pp. 236–238.

Jochimsen, (Lehrer). Mond und das Wetter. Pp. 223–232.

Das Weltall. Berlin. 6 Jahrgang. 1905.

Linke. Ueber die Anwendung von Raketen gegen Hagelunwetter. [Abstract of paper by Vidal in Compt. rend. ac. sc., Paris, Tome 141, p. 98.] P. 34, 34, Oct. 15.

Busch, Friedr. Verhalten der neutralen Punkte von Arago und Babinet während der letzten atmosphärisch-optischen Störung. Pp. 37–41. Nov. 1, 1905.

Wiener Luftschiffer Zeitung. Wien. 4 Jahrgang. Oct., 1905.

Schlein, Anton. Internationale Ballonfahrt vom 6 September 1905. P. 194.

—— Instruktion für die internationalen wissenschaftlichen Ballonfahrten. Pp. 199–200.

Zeitschrift für Gewässerkunde. Dresden. Band 7. 1905.

Ule, Willi. Theoretische Betrachtungen über den Abfluss des Regenwassers. Pp. 65–86.

Memorias y Revista de la Sociedad Científica "Antonio Alzate". Mexico. Tome 21.

Diaz, Severo. Alto-stratus. Su origen, evolución, y función meteorológica. Pp. 237–247.

Journal of the Meteorological Society of Japan. Tokyo. 24th year. Sept., 1905.

Okada, T. Rainfall tables for China and Korea. Pp. 1–12.

RECENT ADDITIONS TO THE WEATHER BUREAU LIBRARY.

C. FITZHUGH TALMAN, Acting Librarian.

The following titles have been selected from among the books recently received, as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies. Most of them can be loaned for a limited time to officials and employees who make application for them.

Agra and Oudh United Provinces. Meteorological Reporter.
Administration report 1904–5. 4 pp. f°. Allahabad, 1905.
Annual statement of rainfall for 1904. 13 pp. f°. [Allahabad, 1905.]
Brief sketch of the meteorology of the United Provinces for 1904. 9 pp. f°. Allahabad, 1905.

Alsace-Lorraine. Meteorologischer landesdienst.
Deutsches meteorologisches jahrbuch für 1901; Elsass-Lothringen. VIII, 57 pp. f°. Strassburg, 1905.

Beiträge zur Geophysik; Zeitschrift für Physikalische Erdkunde, hrsg. von Georg Gerland.
v. 2–6, 1896–1904. 8°. Leipzig, 1898–1904. Pub. irregularly.

Bellucci, Giuseppe.
Sull' ozono; note e riflessioni. 456 pp. 12°. Prato, 1869.

Bouches-du-Rhone. Commission de Météorologie.
Bulletin annuel. v. 23, 1904. X, 121 pp. 4°. Marseille, 1905.

British Association [for the Advancement of Science.]
Catalogue of the exhibition of instruments in connection with the meeting of the International meteorological committee, Southport meeting, 1903. 30 pp. 12°. Southport, [1903.]

Buitenzorg. s'Lands plantentuin.
Observations météorologiques 1902. unp. f°. [Batavia, 19—.]

Cambridge Scientific Instrument Company, ltd.
Application of electrical resistance thermometers to meteorology. n. t. p. 4 pp. 8°. Camb. [Eng. 19—.]

Doten, S[amuel] B.
Account of some features of the climate of Reno, Nevada. (Nevada Agricultural Experiment Station. Bulletin No. 59.) 21 pp. 8°. Reno, Nev., 1905.

Dutch East Indies. Magnetisch en Meteorologisch Observatorium, Batavia.
Observations made at the Royal Magnetical and Meteorological Observatory at Batavia. v. 26, 1903. XXXIII, 235 pp. f°. Batavia, 1905.

France. Service Hydrométrique du Bassin de la Seine.
Résumé des observations centralisées...1903. 26 pp. f°. Paris, 1904.

Germany. Deutsche seewarte.
Dampferhandbuch für den atlantischen ozean. XV,435 pp. 8°. Hamburg, 1905.

Hann, Julius.
(Der) tägliche gang der temperatur in der inneren tropenzone. 118 pp. f°. Wien, 1905. Reprinted fr. K. Akademie der wissenschaften, Wien. Mathematisch-naturwissenschaftliche klasse. Denkschriften. v. 78.

Hill, E. G.
Notes on Dines's pressure tube anemometer in use at Allahabad. n. t. p. 7 pp. f°. n. p. [1905.]

Hoffmann, Jakob.
(Die) tiefsten temperaturen auf den hochländer des südäquatorialen tropischen Afrika, insbesondere des seenhochlandes. 56 pp. 12°. Gotha, 1904. Dissertation for the degree of Ph. D. submitted to Giessen Univ., 1904.

India. Meteorological Department.
Report on the administration of the department, 1904–1905. 20 pp. f°. n. p. [1905.]

Internationale Seismologische Konferenz, Strassburg.
Verhandlungen der vom 11 bis 13 april 1901 zu Strassburg abgehaltenen ersten . . . konferenz. . . (Beiträge zur geophysik. ergänzungsband 1.) 439 pp. 8°. Leipzig, 1902. Title and text in German and French.
Verhandlungen der vom 24–28 juli 1903 zu Strassburg abgehaltenen 2ten. . konferenz. . . (Beiträge zur geophysik. ergänzungsband 2.)
362 pp. 8°. Leipzig, 1904. Title and text in German and French.

Japan. Earthquake Investigation Committee.
Publications in foreign languages. Nos. 2, 13, 19. 4°. Tokyo, 1898–1904.

Lockyer, [Joseph] Norman.
Simultaneous solar and terrestrial changes. 21 pp. 8°. Lond., 1903. Proof sheets fr. International meteorological committee, Southport, 1903. Report. Lond. 1904.

McAdie, Alexander [G.]
Los Angeles rainmaking. (Extracted fr. Sunset for Oct. 1905. v. 15, No. 6.) n. t. p. Pp. 575–7. 8°. [San Francisco, 1905.]

Marti, C.
Weather forces of the planetary atmospheres. 21 p. 8°. Nidau, 1905.

Mauritius. Royal Alfred Observatory.
Annual report of the director for 1904. 20 p. f°. [Port Louis, 1905.]

Montevideo. Observatorio municipal del prado.
Anuario meteorológico. v. 4, 1904. 9 p. Montevideo, 1905.

Morandi, Luis.
Contribución al estudio de la climatología particular de Montevideo y general del Uruguay. 14 p. 4°. Montevideo, 1904.

Mysore. Meteorological Department.
Report on rainfall registration for 1904. viii, 47 p. f°. Bangalore, 1905.

Norway. Meteorologiske institut.
Oversigt over luftens temperatur og nedboren i Norge, 1903–04. 2 v. 8°. [Kristiania, 1904–05.]

Observatorio meteorologico del Colegio Pio de Villa Colon.
Año meteorológico 1901–02. 12 p. 4°. Montevideo, 1904.

Rijckevorsel, [Elie] van.
Konstant auftretende secundäre maxima und minima in dem jährlichen verlauf der meteorologischen erscheinungen. 2 pts. f°. Rotterdam, 1905.

Sao Paulo (Brazil). Secretaria da agricultura, commercio e obras publicas.
Breve noticia sobre o clima de Sao Paulo, por J. N. B. Mattos. n.t.p. 16 p. 8°. Sao Paulo, 1905.

Schubert, J[ohannes].
(Die) witterung in Eberswalde im jahre 1904. 10 p. 8°. Berlin, 1905. Reprinted from Zeitschrift für forst- und jagdwesen.

Szalay, Ladislaus von.
Neuere daten zur statistik der blitzschläge in Ungarn. 30 p. f°.

Budapest, 1905. Title and text in Hungarian and German. Reprinted fr Hungary. Országos meteorologiai és földmágnességi intézet. Évkönyvei. (Reichsanstalt für meteorologie und erdmagnetismus. Jahrbücher.) Bd. 33, teil 3.

U. S. Bureau of Plant Industry.
Agriculture without irrigation in the Sahara desert, by T H. Kearney. (Bulletin No. 86.) 30 p. 8°. Washington, 1905. Vegetable, pathological, and physiological investigations.

Vaucluse. Commission météorologique.
Compte rendu your 1904. 32 p. f°. [Avignon, 1905.]

Wallhaüser, Georg.
(Die) verteilung der jahreszeiten im südäquatorialen tropischen Afrika. 55 p. 8°. Darmstadt, 1904. Dissertation for the degree of Ph. D. submitted to Giessen univ., 1904.

Württemberg. Meteorologische zentralstation.
Deutsches meteorologisches jahrbuch für 1900; Württemburg. 84 p. f°. Stuttgart, 1905.

Zölss, P. Bonifaz.
Elektrizitätszerstreuung in Kremsmünster, 1903 bis 1904. (Beiträge zur kenntnis der atmosphärischen elektrizität 18.) n. t. p. 143 p. 8°. Wien, 1905. Reprinted from K. Akademie der wissenschaften, Wien. Mathematisch-naturwissenschaftliche klasse. Sitzungsberichte. bd. 114, abt. 2a.

NOTES AND EXTRACTS.

METEOROLOGY OF THE PLANET MARS.

Many generations of astronomers have been interested in studying the appearances of the various planets as seen through the best telescopes. Most of the planets appear to have gaseous atmospheres analogous to that of the earth, and meteorological phenomena have been observed on their surfaces that are described as clouds, storms, snow fields, etc. In the case of the moon, there are even brilliant points that shine like the reflection from ice. If we could get nearer to these distant celestial bodies we might hope to study the meteorology of their atmospheres as we do that of the earth, for they undoubtedly receive their heat from the sun and are subject to annual and diurnal periods. As it is, however, the best results at present give us only a very imperfect idea of what is going on in their atmospheres. Professors E. C. and W. H. Pickering, of Harvard University, with the help of a magnificent series of photographs of the moon, have demonstrated the probability that here and there on its surface there issue jets of some heavy vapor like carbonic acid gas (since aqueous vapor is too light to stay there), and that this vapor forms white frost-like deposits in shady regions until dissipated by the sun's heat.

Mr. Lowell, of the Flagstaff Observatory, has made an elaborate study of the planet Mars, confirming much that had been done by Schiaparelli, of Milan, and adding some observations and some theories to our previous knowledge. He finds the changes from summer to winter not only well pronounced but varying very much from year to year, just as occurs in our own atmosphere. The melting of the great fields of "snow" around the planet's polar regions, as each Martian winter closes and spring comes on, gives rise to great streams of water (we call it water in the absence of any evidence as to the specific nature of the fluid), and as these streams flow toward the equator a band of green, like grass or foliage, spreads out on both sides so that we seem justified in concluding that the atmosphere and the vegetation as well as the climate of Mars have some analogy with our own. It is, however, very strange that we find no appearance of clouds on that planet, as though it were possible for water, snow, irrigation, and vegetation to exist without clouds or rain. Of course vapor could diffuse from a region of water to one of snow, but not vice versa. We must still study to find out whether this occurs on Mars.

Owing to the inclination of the axis of rotation of Mars and the location of his equinoctial points, his midwinters do not occur at the same time as our own: Thus, a recent report from the Flagstaff Observatory states that the first layer of winter snow (or possibly winter frost work) was observed on Friday, May 19, 1905, and covered a vast area in the northern or arctic region of the planet.

It is quite possible that the atmosphere of Mars has much less of the dry gases, such as oxygen and nitrogen, and relatively more moisture, so that its general circulation is based on small differences of vapor pressure. Consequently the transfer of moisture from its poles to its equator and back again takes place in a gentle way, more like diffusion through a vacuum than like convection by a gas; so that there are fewer cyclonic storms, perhaps none at all.

MR. HARRY B. WREN.

Mr. Harry Bertrand Wren, Observer, Weather Bureau, died October 1, 1905, at Paola, Kans., of a pulmonary affection. Mr. Wren entered the Weather Bureau in June, 1898, and served at Denver, Cheyenne, Baltimore, and the Central Office. He was a graduate of Baker University, Baldwin, Kans., from which institution he received the degrees of Ph. B. and M. A. Mr. Wren was a man of high character and attainments and of a pleasing disposition; he gave excellent service as an observer in the Weather Bureau.—*H. E. W.*

EIFFEL'S "ETUDES PRATIQUES."

The eminent engineer, Monsieur G. Eiffel, of Paris, to whom we owe the Eiffel tower and its unique meteorological observatory in midair a thousand feet above the ground, has published a very elegant volume of studies based on observations at three stations established by himself, in order to investigate three special types of climate in France. These stations are Beaulieu-sur-Mer representing the climate of Nice; the chateau of Bruyères representing the climate of Sévres, near Paris; and finally, a station on his estate, Vacquey, representing the climate of Bordeaux. These three stations, he says, should give us a general idea of three important portions of France, viz, the southern shore of France known as the "Côte-d'Azur", and the oceanic coast in the neighborhood of Bordeaux, and the climate of Paris, which latter may serve as a common standard of comparison for the other two. At each of these points Eiffel established a thermometer shelter of the model adopted by the Central Meteorological Bureau of France, which allows of the freest possible circulation of the air while protecting from the direct rays of the sun and direct radiation into space.

He first calls attention to the fact that ordinary self-registering thermometers show such rapid oscillations in temperature every few minutes during the whole day that the thermometers in ordinary meteorological use can not follow them accurately, nor is it desirable that they should, that in fact the climatologist wants only the average warming and cooling of the air, and that the mixture of hot and cold masses in the atmosphere must render illusory any attempt to determine the temperature of the air at any moment to the tenth of a degree centigrade. The mean temperature of the day can be obtained from thermometers so sluggish that they are always two or three tenths behind. Nothing is easier than to read a thermometer to the tenth of a degree, but there is no reason to attach much importance to these tenths except in the cases where the difference of two adjacent thermometers is desired, as in using the whirled psychrometer, or where we are determining vertical or horizontal gradients of temperature.[1] On the other hand, the continuous registers, with all their oscillations, show what a very imperfect idea we get of the atmospheric temperature when we have only three readings a day. Notwithstanding the imperfections of the thermographs due to the nature of the liquid employed and the friction within the apparatus, and notwithstanding the fact that they

[1] It is by observing the tenths of divisions that astronomers, physicists, chemists, and meteorologists have been stimulated to greater precision in all their work, and have attained a better knowledge of nature.

are looked upon with suspicion by those who seek the greatest but illusory precision—Eiffel states that he would urge their general employment, that is to say, self-registers should be used for every class of current observations, and their records should be considered as a means of reducing to a minimum the labor and the chance of error that attend personal observations. He adds that in his opinion the self-registers should be regulated not according to the legal hour but according to local solar time since the sun is the source of all meteorological phenomena. This adoption of the local hour seems to him essential because there can exist a difference of three-fourths of an hour between different points in France so that the temperature at sunrise at Nice should be compared with that of sunrise at Brest and not with that taken three fourths of an hour before sunrise; from a climatological point of view observations taken simultaneously on legal time can not be comparable with each other. But the error introduced by adopting several fixed hours for daily observation does not trouble us when we study the amplitudes of any phenomenon. The graphic presentation of daily maxima and minima is usually made by means of an upper and a lower curve between which there is included an area showing the diurnal range of temperature during the different portions of the year. These curves are singularly interesting and become the foundation of many studies of comparative climatology.

In such studies, moreover, Eiffel prefers the meteorological year, December to November, inclusive, rather than the civil year recommended by each International Meteorological Congress and used almost universally by meteorologists. He states that he regrets thus to differ from others, but thinks it impossible to admit any other grouping of the months. He also subdivides each month into three decades, namely, two groups of ten days each followed by one of eight, nine, ten, or eleven days according to the month. He thinks this is better than fifty-two weekly groups, but says nothing about the comparative convenience of the pentads and decades introduced by Dove which are now widely used both in and out of France. We can but think that the points urged by Eiffel as to local time and decades are less important to the world at large than the uniformity urged by the successive international conventions. We doubt very much if anything is gained from a climatological point of view by conservatively declining to give up these irregular subdivisions of the month, and the so-called local mean solar time. The diurnal periods of temperature, wind, pressure, etc., are controlled by apparent noon and apparent time, not by mean solar time.[2]

On the other hand we have been greatly pleased to find that Eiffel has supplemented the whirling psychrometer by an earnest attempt to make comparative observations with Edelmann's psychrometer, which really gives us a direct measurement of the elastic force or vapor pressure at any time or place, although often not more accurate than given by the formula for the whirling psychrometer. The reader will find the Edelmann instrument, its construction, theory, and method of use, fully described in the Zeitschrift für Meteorologie, Vol. XIV, 1879, as well as in the Editor's Treatise on Meteorological Apparatus and Methods. The ordinary formulæ and tables for use with the whirled psychrometer require the preliminary determination of one or two numerical constants; this has ordinarily been done by means of comparative observations with the dew-point apparatus and the vapor pressure given by Regnault's or some equivalent tables of vapor pressure for saturated vapor. But the Edelmann apparatus enables us to avoid this circuitous process and determine the vapor pressure directly. The only doubt is as to whether his method and apparatus can compare in accuracy with the results of the years of labor that have been given to improving the psychrometer and its formula.

With reference to hygrometry in general, Eiffel introduces a system of terms that seems to him to better represent the ideas that we wish to convey. He would replace the expressions "relative humidity, or hygrometric state, or fraction of saturation," by the term "hygrometric ratio" as expressing simply the percentage of saturation. Again he would replace the words "absolute humidity, or elastic force, or vapor tension" by the single word "humidity," meaning thereby the weight in grams of the aqueous vapor contained in a cubic meter of air. He presents on page 66 a diagram or "hygrometric abacus" for obtaining graphically the value of the hygrometric ratio when the humidity and temperature are known. We do not quite see that this graphic table is any easier to use or even as easy as the ordinary numerical table, but there are special problems bearing on the condition of the atmosphere in which it will doubtless be of great use.

An interesting note at the bottom of page 68 quite agrees with observations frequently made elsewhere, viz, that saturated air is almost never to be found. Even in the midst of a fog the air is rarely saturated. The mean of the observed maximum tensions corresponding to the two temperatures of two masses of air that mix together and form fog is always greater than the maximum tension corresponding to the mean of the temperatures. The heat given out by the precipitation of the vapor as fog first warms the air above this mean temperature, and so long as this heat is not lost by radiation or conduction the fog is lifted and the air warmed so that its temperature would seem to be too high to correspond to the observed maximum tension.

On page 76 we find a representation of the psychrometrograph with aspiration, as constructed by W. Lambrecht at Göttingen. Eiffel reports that this apparatus performs very satisfactorily. The wet thermometer is a minimum thermometer, which therefore registers the lowest temperature attained during the aspiration, and care must be taken to supply its muslin covering with an abundance of water. He notes that even this arrangement, however, like all other forms of psychrometer, can not be recommended for use at temperatures below freezing, in which cases the hair hygrometer alone can be relied upon and is in fact, he says, in general use in meteorological observatories. As the hair hygrometer is rarely used in America, we ought, perhaps, to quote the conclusions arrived at in 1901 by Pircher, at Vienna, which substantiate the views held by Pernter and with which Eiffel seems to agree. They are as follows:

1. The readings of the hair hygrometer are independent of temperature.

2. They never vary more than four per cent from the true relative humidity, and even a ventilated psychrometer will not have smaller departures from the truth.

3. A nonventilated psychrometer has much larger errors than the hair hygrometer.

4. The readings of the hair hygrometer are independent of the velocity of the wind.

It results from all this that the hair hygrometer is at least as correct as the ventilated psychrometer. It is, moreover, easier to read and its employment is to be recommended, provided we take the necessary precautions as to its standardization by frequently adjusting the 100-degree point under a bell glass containing saturated air.

[2] Apparent noon, or the moment when the center of the true sun is on the meridian, occurs about fourteen and one-half minutes after mean noon in February, about four minutes before noon in May, six minutes after at the end of July and sixteen minutes before mean noon about the first of November. Or again when a correct mean time clock says mean noon in February the sun is fourteen and one-half minutes of time east of the meridian; in May it is four minutes west; in July six minutes east; and in November sixteen minutes west of the meridian. These oscillations between +14 and —16 minutes are quite comparable with the changes introduced by using the mean time of some standard meridian, and must be allowed for in all refinements as to insolation and temperature.

Having settled these details, Eiffel established several forms of hygrometer and carried out comparative observations, from which he concludes that the Lambrecht polymeter and thermohygroscope as well as Lambrecht's weather telegraph with rules based on the observed temperature, pressure, moisture, and wind, give prognostics that are generally exact. American observers in a much drier climate have not reported so favorably.

The remaining chapters of this volume are devoted to the rain, clearness of the sky, the wind, and the barometer, followed by appendices giving tabular summaries of the observations from 1879 to 1903. A separate volume of diagrams and charts accompanies the text.

METHODS OF TEACHING METEOROLOGY.

Numerous requests are received from those giving limited courses of instruction, both Weather Bureau officials and nonofficial teachers, asking for sets of lantern slides to illustrate lectures; card indexes to current literature; and various publications bearing on meteorology with the idea that all these will help to keep the instructor informed as to the latest discoveries and will also enable him to give popular public lectures.

It seems to the Editor that the instruction in meteorology given in most of our schools and colleges needs to be of a fundamental, solid, character, and not of the popular superficial character appropriate to lectures that are illustrated by lantern slides. The study of the subject as expounded in the textbooks of Davis, Waldo, Ward, Hann, and others implies considerable intense thought. Laboratory experiments will often be very useful in elucidating the subjects of moisture, rainbows, halos, waterspouts and tornadoes; carefully drawn charts elucidate hurricanes; actual work with thermometers and perhaps with kites will interest every student in the distribution of temperature in the atmosphere; but a lecture with stereopticon illustrations should only come in as a sort of luxury once or twice during the course. It is really not at all essential. It is especially important for the teacher himself to be so interested in his subject as to devise his own diagrams and apparatus, at least some of them. Almost anyone can make a crude nephoscope out of a bit of mirror, or the cover of a tin pail turned over and filled with water. It is not necessary to buy a $50 barometer in order to explain or observe the variations of atmospheric pressure. It is only after one has taught in his own original way for several years that he begins to realize the power of his own ingenuity and finds that he is doing better with crude material than many another man is doing with an elaborate equipment. If the educational apparatus that he devises is copied, manufactured, and sold to other teachers by some enterprising, money-making firm, that simply proves that some are intellectually sluggish and do not push their own school work on the independent, original basis that he himself does. There is no reason why the Weather Bureau officials should not take the lead in devising the best methods of teaching meteorology and climatology.

THE RAINFALL OF MEXICO.

The Annals of the Association of Engineers and Architects of Mexico has published in its twelfth volume, among many other interesting papers on engineering, one by Romulo Escobar, on the "Regimen of the Rainfall of Mexico." He gives in detail all accessible special items relative to the measurements of rainfall for a large number of stations. What particularly interests us is the comparative table from which we have made the following abstract showing the average rainfall for each successive lustrum. In place of taking an indiscriminate average of many years at one station and a few years at another we are able now to compare the simultaneous rainfalls at different places, and indeed if there were only stations enough, or if Mexico had not such a very irregular orography, one might be able to reduce the whole system of measurements to one uniform fundamental period of standard lustra, such as, for instance, as 1881–1900, inclusive. Among his general conclusions, Escobar calls attention to the fact that most stations show a steady diminution for a long period of years, but that this has already begun to be followed by an increase. A similar diminution has been observed in our Gulf States from Texas to Alabama and Tennessee, but perhaps the subsequent increase that may be expected has not been everywhere observed owing to the frequent changes in our rain gages and their exposures.

Average annual rainfall, by lustra, with number of years of record. Amounts in millimeters.

Stations.	Before 1877.	1877–1881.	1882–1886.	1887–1891.	1892–1896.	1897–1901.
Hacienda el Carmen						5 684.8
Querétaro		5 623.8	5 518.3	5 486.4	5 386.1	5 430.8
Zapotlán					3 805.0	5 977.5
Linares					1 796.0	5 844.6
Aguascalientes		1 418.4	5 607.1	1 542.2		
Guanajuato		1 893.5	5 818.9	5 721.7	5 526.5	4 680.0
Jalapa					3 1334.3	4 1657.9
Morelia			1 648.8		3 661.5	5 703.7
Oaxaca		3 715.3	4 716.7	5 943.5	5 804.9	2 862.2
Tepic	19 1433.7		2 2301.7	5 1435.1	3 1334.3	
San Luis Potosí		4 403.9	5 365.2	5 426.2	5 284.6	4 303.8
Hucjutla			5 1175.1	3 1538.1		
Pabellón		5 515.6	5 499.9	4 584.6		
Tacubaya			3 585.0	5 773.4	5 533.8	4 660.5
Real del Monte				3 873.0	5 606.1	4 835.3
Teziutlán		3 1716.8	2 1251.9	1 2268.2		
Túxpan		2 1549.0	3 1197.1	3 1584.7		
Merida				2 887.5	5 801.9	5 924.5
Monterey			2 422.2	5 335.2	5 398.2	5 712.9
Mazatlán		2 1201.4	5 842.7	5 758.7	5 669.2	5 794.4
Colima		4 1045.5		1 1233.0	5 821.0	4 1000.9
Pachuca					4 293.9	5 2254.4
Puebla, Col. Católico		5 1144.9	5 1258.2	5 1373.1	5 988.4	5 893.3
Puebla, Col. del Estado		4 963.4	5 860.3	5 969.4	5 821.5	5 810.9
México	15 671.3	5 566.2	5 589.0	5 651.4	5 471.1	5 577.9
Toluca			2 678.0		5 671.7	5 681.0
León		4 691.5	5 745.1	5 743.2	5 504.0	5 565.9
Saltillo			5 560.0	5 597.7	5 641.9	5 441.5
Guadalajara	3 810.3	5 941.5	5 829.9	5 992.0	5 1487.5	4 1493.1
Zacatecas		4 655.5	5 898.2	5 811.6	5 302.0	5 593.6
Galveston, Tex		4 1219.5	5 1269.6	4 1159.1	5 830.4	4 1159.9
El Paso, Tex		3 331.6	5 278.7	4 164.2	5 205.3	4 214.7
Yuma, Ariz		4 50.1	5 91.7	1 90.2	5 68.8	4 50.3

TEMPERATURES ON MOUNT ROSE, NEV.

Prof. J. E. Church of the University of Nevada at Reno, Nev., has made an effort to obtain a record of temperatures on the summit of Mount Rose, whose elevation is approximately 10,800 feet, latitude 39° 20′ north, longitude 119° 55′ west. Maximum and minimum thermometers were established in a small thermometer shelter at the summit toward the end of June and will be visited and reset as often as practicable. The record for the first three months is as follows:

Between June 29 and August 24, maximum 71.2°, minimum 24.0°.

Between August 4 and September 4, maximum 70.8°, minimum −2°.

Between September 4 and October 7, maximum 65.5°, minimum −4.5°.

At the last reading a partial coating of ice was found on the bulbs of both thermometers and the actual reading of the minimum thermometer at that time after resetting was 23° and a stiff wind was blowing. Ice crystals an inch long fringed the shelter.

A rain gage is also established at the same place and the total accumulated precipitation during the three above mentioned intervals was 0, 0.41, and 0.08 inch, respectively. On October 7, snow lay on the ground in small patches from 2 to 15 inches deep.

Professor Church noted on September 4 that wild currants on the summit were ripe and daisies were still yellow in spite of the temperature of −2°.

The low temperature, −4° F., during the month of August at the summit seems at first in striking contrast to the hot weather experienced in the lowlands, but is fully explained by considering all the circumstances that go to determine the temperature of any layer of air in the atmosphere. Of course in lowlands minima mostly occur at nighttime and are mainly due to the influence of radiation of heat from the ground. Cooling by radiation takes place far more rapidly from the rocky surface of a mountain than from a particle of air distant therefrom. The cold air chilled by contact with and by radiation to the mountain surface flows to a lower level and continues cooling while a fresh supply takes its place; therefore temperatures fall much lower in shallow basins where the cold can intensify than they do on pinnacles of rock where no accumulation of quiet cold air and no intensification of cold can take place. Temperatures will fall to an unexpected degree if air or water is kept in a shallow basin which can lose by radiation but can gain none by convection. The mountain winds or valley winds that begin to be felt in the afternoon and continue strong during the whole night represent the downflow of cool air from the upper parts of the mountain whose forests or rocky soils are cooled by radiation. This descending cool air is warmed up by compression as it comes under greater atmospheric pressure and the rate of warming averages very nearly one degree Fahrenheit for each 186 feet of descent, but if it receives a little heat from other sources, or if it mixes with the warmer air of the lowlands this rate of warming may be one degree for 150 feet or even 100 feet; thus at Reno itself, whose station is 4484 feet above sea level and 6316 feet below the summit of Mount Rose, we should expect to find differences of at least 40° or 60° between the two places and if the location of the thermometer on the summit is such that it comes under the special influence of local radiation, then the differences may be greater to almost any extent. It is even possible that a special cold wind from the north such as occurs in our areas of high pressure and cold waves may bring temperatures to the summit of the mountain for a few hours during clear hights such as are out of all proportion lower than those of lower stations.

The lowest temperature recorded at the State University during the interval, August 4–September 1, was 46° and this would ordinarily correspond to something between 16° and 26° at the summit. The difference between this and the observed record of −2° is probably to be attributed in part to the great radiation taking place from the rocks of the summit and the imperfect ventilation within the thermometer shelter, but largely to the fact that there pass over mountain top masses of air that are very cold but do not of themselves settle down into the valley below. They come with the areas of high pressure, spread out horizontally mostly southward and southeastward or even eastward with great velocity and descend to the earth on a very gentle gradient, so that by mixture and solar radiation they are warmed up before reaching the cold stratum covering a distant lowland region. Such low temperatures are common on all the mountain peaks although the lowest temperatures will happen in the lowlands if cold air accumulates at nighttime and the warmer air has to stay above it. Balloon work has shown that there may exist even three or four alternations of temperature along the vertical and that therefore the atmosphere is often in unstable equilibrium within a definite special range of elevation.

PROTECTION FROM FROST.

Mr. A. C. Bennett, a Wisconsin cranberry grower, writing under date of May 15, 1905, describes the methods used by him for the protection of his cranberry marshes against frost as follows:

> At Cameron, Wis., I have a large marsh almost entirely surrounded by banks 25 to 35 feet high, with sloping sides. I have a fine trout stream for my water supply. My principal reservoir is northwest of the plantation, and I divert the creek from its old bed and carry it around outside of the marsh, forming a succession of reservoirs entirely surrounding the marsh on its border, from 5 to 30 rods wide.
>
> The cold air as it slides down the high surrounding banks must cross the reservoirs of water and pass over the dams before it can reach the vines. The outlet of the marsh is through a ravine at the south, and gives air drainage to the Menominee River.
>
> I think this would be an ideal place to test the plan of fencing off the upland cold air, also the plan of adding humidity to the air by using the water in the creek to run sprayers as it comes from the large reservoir northwest of the planted marsh.

PUBLICATION OF THERMOGRAMS IN FACSIMILE.

The San Diego Chamber of Commerce has shown its interest in the study of the climate of that region by issuing a monthly sheet embodying a photographic reduction of the complete thermograph record for the month and also the regular Monthly Meteorological Summary as furnished by Mr. Ford A. Carpenter, the Official in Charge of the Local Office of the Weather Bureau at San Diego.

This offers striking evidence of the temperature conditions at San Diego and will be very convenient for the use of those who desire to compare local temperatures with hygienic and crop conditions.

STRUCTURE OF HAILSTONES.

A curious fact was noted some years ago by a close observer, namely, that hailstones when melting away in a pail of water end their career by giving up a large bubble of air which had evidently been enclosed under great pressure in the white snow that forms the center of the hailstones. We hope that many of our observers, regular or cooperative, may have the opportunity to repeat this observation and will send us the results, whether positive or negative. Observe as closely as possible the size of the cavity that appears to contain the air and also the size of the bubble of air as it ascends through the water. In fact the latter measurement may be made quite easily by using soap suds instead of pure water and measuring the size or volume of the soap bubble. Many hailstones should be measured so that we may figure on the variations that must occur between them.

THE PAGOSCOPE VERSUS THE DAILY WEATHER MAP.

Pagoscope is the name of a new device for popular use in France tending to lighten the labor of deciding whether there is danger of a severe frost during the approaching nighttime. The instrument attempts to show at a glance whether the prevailing dew-point is below freezing, or 32° F., and leaves it to the observer to infer that if below freezing then a frost is pos-

sible. But the fact is that frosts depend on the movement of the great areas of clear dry air and on this point an observer must consult the daily weather map, since a local instrument no matter what its name or style can tell us little or nothing. We know that in a general way these areas move to the south and east over the United States and sometimes spread westward, while the center is moving southward, but this knowledge is derived from the weather maps and all special cases must be studied with their help.

The pagoscope, so-called, is essentially the same as the well known "hygrodeik," having wet and dry bulb thermometers with an engraved dial card between them and a sliding pointer attached to a vertical frame. By setting the indexes at the readings of the dry bulb and wet bulb, respectively, we mechanically cause the pointer to move over the surface of the dial card and when it comes to rest it points out the vapor pressure, relative humidity and dew-point prevailing at that moment. The pagoscope seems to differ from the hygrodeik only in that the area on the diagram corresponding to temperatures near freezing is colored yellow; if the dew-point is decidedly below freezing, so that frost is highly probable, the area is colored red; if the dew-point is decidedly above freezing, the corresponding area is colored green, in which case frost is not likely unless a wave of colder, drier air advances from a distance to the station. But this latter is exactly what is so likely to happen, and in order to anticipate this danger we must study the daily weather map.

WEATHER BUREAU MEN AS EDUCATORS.

Mr. F. H. Brandenburg, District Forecaster, Denver, Colo., reports under date of September 30, 1905, that while at Mancos, Colo., pursuant to the request of the principal of the school, he gave an informal talk to the pupils of the high school regarding the work done by the Weather Bureau.

Mr. George W. Chappel, Local Forecaster, Des Moines, Iowa, reports that on October 18, 1905, he gave a talk to the students in the Soils Department of the State Agricultural College at Ames. The morning map of the 14th was reproduced and the methods of taking observations, transmitting reports, making maps, and disseminating information were explained. A full explanation was given of the course usually taken by the high and low areas, the circulation of winds, areas of precipitation, etc.

Dr. I. M. Cline, District Forecaster, New Orleans, La., reports under date of November 6, 1905, that on October 10 he delivered a lecture to the combined Epworth League societies of New Orleans on the weather map and forecasting the weather. About 400 persons were present.

Mr. L. M. Dey, jr., Assistant Observer, Lewiston, Idaho, reports that the physical geography class of the State Normal School visited the office on October 20, 1905, for the purpose of receiving instruction in the drawing of isobars and isotherms on the daily weather map.

Mr. R. J. Hyatt, Local Forecaster, Salt Lake City, Utah, reports that the training class of the Latter Day Saints University visited the office on October 9 and 10, and were instructed in meteorology and were shown the workings of the office.

The principal of the Training School of the University of Utah also visited the office and was shown the instruments, weather maps, and the manner of taking the observations. The pupils of the Training School will visit the office later for instruction.

Mr. D. S. Landis, Assistant Observer, Fort Worth, Tex., reports under date of August 22, that he has a class of four young men who are studying meteorology systematically, using Waldo's text-book, two hours a week.

Mr. U. G. Purssell, Local Forecaster, Erie, Pa , reports under date of October 31, 1905, that the class in physical geography of the Erie High School visited the office on October 24 and 25 for instruction in the use of meteorological instruments and in the preparation of the daily weather map.

Mr. Clarence J. Root, Assistant Observer, Charles City, Iowa, reports under date of August 11, 1905, that he gave a stereopticon lecture on the U. S. Weather Bureau and its work to an audience of over 3000 at the Charles City Chautauqua.

Mr. M. R. Sanford, Observer, Syracuse, N. Y., reports that he gave a course of twelve lectures on meteorology and climatology in the Syracuse University during the second semester of the college year, 1904–5. The course consisted of one lecture each week and class exercises in map making. Weather Bureau forms, charts, and instruments were used in illustrating the methods in practical use.

Mr. A. H. Thiessen, Section Director, Raleigh, N. C., under date of September 8, 1905, submits the following outline of a course of lectures which will be given to a class of agricultural students at the Agricultural and Mechanical College of North Carolina at Raleigh.

METEOROLOGY AND CLIMATOLOGY.

1. Meteorology and climatology defined. The atmosphere, its position, composition, functions, physical properties.
2. Nature of heat, temperature, radiation, absorption, reflection, conduction, temperature gradients, thermometry.
3. Atmospheric pressure, decrease with altitude, barometric gradient, convection, general circulation of the atmosphere.
4. Local winds and storms. Thunderstorms, tornadoes, water spouts, land and sea breezes, foehn, mountain and valley breezes, winds from snow fields, eclipse breezes.
5. Moisture in atmosphere, condensation, evaporation, dew, cloud, snow, hail, fog, frost, causes of precipitation.
6. Miscellaneous phenomena. Clouds and their classification, thunder, lightning, aurora, rainbows, corona, halo, color of the sky, of the sun, mirage.
7. Cyclones and anticyclones. Law of storms, cyclones, tropical cyclones, origin of cyclones.
8. History of thermometry. Thermometers, gas, liquid, metal, thermographs. History of barometry. Barometers, wind instruments, sunshine recorders, actinometers, rain and snow recorders.
9. Weather. Elements to be observed, how observed, measured and recorded, how charted and studied, weather forecasts.
10. Climatology. Factors of climate; temperature, moisture, rain, snow, sunshine, wind, solar climate, influences which change solar climate, continents, seas, forests, mountains. Periodic variations in climate. Climate of earth during geologic periods.
11. Practical application of meteorology and climatology to manufactures, commerce, and agriculture.
12. The weather organizations of the world, with particular reference to the U. S. Weather Bureau.

The class will visit the Weather Bureau Office at Raleigh during the term, witness map-making, the process of formulating forecasts, and will examine instruments and records.

Mr. George T. Todd, Local Forecaster, Albany, N. Y., reports that during September a class from the Albany High School, and on October 27, a class from the State Normal

College, visited the office to have the instrumental equipment, weather map, and map-making process explained to them.

Mr. E. C. Vose, Section Director, Parkersburg, W. Va., delivered a talk on meteorology and the Weather Bureau on September 14, 1905, and another before the Farmers Grange, at Green Sulphur Springs, on the work of the Weather Bureau relative to agriculture, about September 30.

Mr. F. J. Walz, District Forecaster, Louisville, Ky., reports under date of November 1, 1905, that he gave a talk to the students of Loretto Academy, Loretto, Ky., on October 27, on the subject of meteorology, methods of weather forecasting, and the practical uses of the Weather Bureau.

He also reports that he gave a talk on the subject of meteorology and the work of the Weather Bureau to the students of Bethlehem Academy, St. Johns, Ky., on October 30.

Mr. R. F. Young, Section Director, Helena, Mont., reports that on October 25, 1905, he addressed the students of the Science Department of the Montana College, Deer Lodge, Mont., on the subject of the weather map.

METEOROLOGY IN COLLEGES AND UNIVERSITIES.

Prof. George Severance, Assistant Agriculturist at the State Agricultural Experiment Station, Pullman, Wash., reports:

> We are giving a two-fifths course in meteorology to freshman college students; that is, two lessons per week for eighteen weeks. Regular students here carry four daily subjects. We have been using Davis's Elementary Meteorology, but find it scarcely adapted for so short a course.

Rev. J. A. Bauman, of the Department of Mathematics of Muhlenberg College, Allentown, Pa., states:

> Muhlenberg College has had meteorology on its list of required studies for quite a number of years. This year radical changes have been made in the curriculum, and now meteorology is an elective study in the senior year. A fair proportion of the next senior class has elected it.
>
> Heretofore we simply studied and discussed Davis's Elementary Meteorology, but this year and henceforth I propose taking meteorology up more practically, and any help will be welcome. It is possible we shall get some of the instruments needed. We have two good barometers, one mercurial, the other aneroid. The teacher of physics is interested, and asked for additional instruments. I hope, therefore, that we will soon be well equipped for the work. It was a surprise to me that so many elected the subject. It indicates interest and has produced necessity for a wider treatment of the subject.

The following is extracted from the Chattanooga News of September 14, 1905:

> At a cost of $45,000 the city of Chattanooga has built one of the best adapted high school buildings in the south. The building has a capacity of 500 pupils.
>
> On the third floor a special room for the study of meteorology has been set apart. A stairway leads from this room to an observation platform on top of the building almost directly over the main entrance.
>
> The high school will be equipped with the best meteorological apparatus that can be secured, and will have everything necessary to a thorough knowledge of the subject.

METEOROLOGY IN GERMAN UNIVERSITIES.

In the MONTHLY WEATHER REVIEW for July, 1905, page 321, we have published a list of the German universities that distinctly recognize meteorology as a part of the course in geography or geology. Other universities, however, treat of meteorology as a branch of physics and others again as a branch of mathematics. We compile the following items from a full list of courses of instruction given on pages 459–463 of the Jahresbericht of the German Mathematical Association for September, 1905:

Strassburg.—Professor Hergesell: Physics of the earth; the form and mechanics of the earth. Becker: Determination of the orbits of meteors, comets, and planets. Wislicenus: Photometry of the sky.

Stuttgart.—Professor Hammer: Barometric hypsometry.

Tuebingen.—Professor Waitz: Theoretical physics, section 2, meteorology.

Doubtless, many other lecturers on mathematics and physics touch upon our meteorological problems, especially those who lecture on hydrodynamics and thermodynamics, but we have omitted their names in the absence of any special indication of the range of their lectures. However, the following list includes some of those from whom we have reason to expect that some branch of meteorology will be touched upon:

Berlin.—Knoblauch: Analytical mechanics. Helmert: Force of gravity and the figure of the earth. Scheiner: Introduction to astrophysics. Weinstein: The figure and the temperature of the earth and the mechanical theory of heat. Planck: Theory of heat and the radiation of heat. Boernstein: The construction and use of physical apparatus.

Bonn.—Monnichmeyer: The method of least squares. Bucherer: The interference and polarization of light.

Breslau.—Lummer: General physics. Meyer: Energetics and thermodynamics. Schaefer: Visible and invisible light.

Dresden.—Helm: Analytical mechanics; special chapters on mathematical physics. Toepler: Elastic oscillations and acoustics.

Freiberg in Baden.—Koenigsberger: Elements of partial differential equations and their applications to physics; the kinetic theory of gases; introduction to independent work in theoretical physics. Mayer: Mechanical theory of heat and its applications.

Greifswald.—Engel: Analytical mechanics. Schreber: Thermodynamics, with applications to heat engines.

Hanover.—Reinherts: Higher geodesy.

Heidelberg.—Koenigsberger: Analytical mechanics. Wolf: Theory and results of spectrum analysis. Pockels: Theoretical physics. Weber: Vector analysis and its applications to theoretical physics.

Carlsruhe.—Schur: Descriptive geometry and graphic methods. Ludwig: Photogrammetry.

Kiel.—Weber: Electrodynamics. Becker: Radioactivity and cathode radiations.

Leipsic.—Neumann: Seminary in physics. Marx: Ionization of gases.

Rostock.—Kuemmel: Introduction to the mathematical treatment of scientific questions.

Strassburg:—Reye: Physical seminary. Weber: Mathematical seminary.

UNUSUALLY EARLY SNOW IN ALASKA.

The surveying parties of the U. S. Geological Survey having been engaged in central Alaska during the summer in the valley of the Yukon River, were driven from their work about the 15th of September by heavy snow, such as was entirely unexpected at that season of the year, and only after great hardships did the men reach civilization alive. One can but wonder whether this early Alaskan snow is to be followed by an early winter or severe winter in lower latitudes on the North American Continent. At the present writing (November 28, 1905) the phenomenal area of low pressure extending from the north Pacific to the Lake region would seem to suggest that there has been an unusual movement or extension eastward of the subpermanent area of low pressure that usually stretches from Sitka westward over the Aleutian Islands as a narrow belt in November, but a larger area in December and January. The circulation around this area of low pressure is usually spoken of as determining the character of the weather on the Pacific coast and giving rise to the centers of low pressure that advance eastward over the United States and Canada, so that our weather is determined as much by its extent and location as by the high pressures that move southward over the interior of our continent.

THE DEFLECTION TO THE RIGHT.

The difference between the deflection to the right in the Northern Hemisphere and that to the left in the Southern Hemisphere results from the nature of the forces that produce these deflections, and not from the way in which the observer looks at the weather map. The deflections are true natural phenomena, not mere optical delusions.

When a body rests quietly on the earth's surface the centrifugal force, *cd*, due to the diurnal rotation of the earth, gives the body a slight tendency to move toward the equator, which tendency is counterbalanced by the fact that the surface of the earth, and especially of the ocean, is an oblate spheroid; the attraction of gravity, *ac*, is not perpendicular to this spheroidal surface, but is directed toward the center of the earth

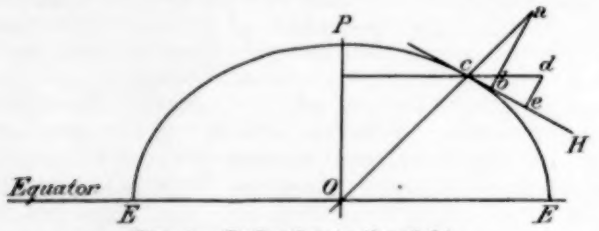

FIG. 1.—Deflection to the right.

and its action on any body at the surface must be resolved into two components; the principal one, *ab*, is vertical or normal to the spheroidal surface and constitutes the greater part of what we call weight, the other component, *bc*, is a feeble horizontal sliding force directed toward the pole (the North Pole in the Northern Hemisphere and the South Pole in the Southern). The centrifugal force, *cd*, is directed outward in the plane of the small circle of latitude and is also to be resolved into two parts, one of which, *ed*, is normal to the surface of the spheroidal globe; it acts upward, and therefore partly counteracts the force of attraction; the difference between it and the attraction is called *apparent gravity*, and gives rise to what is ordinarily known as the weight of a body. The other component of the centrifugal force, namely, *ce*, is parallel to the surface of the globe and is a horizontal sliding force directed toward the equator. But as the earth's surface represents a state of equilibrium, therefore the two horizontal components, respectively pushing northward and southward, just counterbalance each other, or *bc* is equal and opposite to *ce*. If the earth should rotate faster or slower, then the curvature of the spheroid would change so as to always maintain this balance between *bc* and *ce* so that bodies would have no tendency to slide either north or south.

Now a body or a mass of water or air that is in motion east or west relative to the earth's surface is rotating around the earth's axis respectively faster or slower than the earth itself. If it has a greater velocity than the earth, it must therefore have a greater tendency to slide toward the equator; if it moves westward, as does an easterly wind, then it presses from the equator. These laws are true for both hemispheres; in both cases a west wind moving eastward presses toward the equator, which is toward the right-hand for west winds in the Northern Hemisphere but toward the left-hand for the Southern Hemisphere. Other pressures may also affect the motions of the wind so that these deviations to the right or to the left may not become apparent, but the tendencies or pressures always exist and are greater in proportion to the relative velocity of the wind relative to the earth's surface, and they contribute appreciably to the low pressure in a hurricane center and the high pressure in a high area.

When we consider a cannon ball, a railroad train, a pendulum, or a gyroscope this deflection due to the rotation of the earth is at once apparent. When a pendulum is allowed to swing freely its plane of oscillation changes continuously relative to the supports of the pendulum at a certain definite rate depending on the latitude, the rate is most rapid at the pole and is zero at the equator. It is the same way with the plane of rotation of the gyroscope on its axis. "Ordinarily neither the pendulum nor the gyroscope comes back to the plane of rotation in 12 to 24 hours. The pendulum will do so at the poles, but the gyroscope can preserve an invariable plane only in the absence of friction and when its axis is parallel to that of the earth, or whenever it is mounted in gimbals in such a fashion as to realize literally a ideal frictionless *point suspension at the center of gravity.*" Every moving body has a tendency to retain its *direction* of motion and its momentum or inertia, and it is the effort to do this or the combination of this effort with the effort of the rotating earth to change that direction or momentum that causes the pendulum to move in a new resultant direction. These changes of the planes of the pendulum and the gyroscope are real, they can easily be observed, and they agree entirely with the calculation of the resultant of the action of two forces, namely, the initial motion of the moving mass and the disturbance of this motion by the enforced diurnal motion around the earth's axis.—*C. A.*

CORRIGENDA.

Hawaii.—Continued unsettled conditions, with heavy windward rains, but month rather dry in many leeward localities; days warm, but nights appreciably cooler. Young cane grew well, but excessive moisture and shortage of labor rendered difficult the keeping down of weeds in windward plantations. 1906 cane maturing; tasselling general by close of month. Cane growth in Kau, Hawaii, retarded during major portion of month by dry and windy weather. Pineapple growers busy all month expanding plantations; a fine winter crop maturing rapidly, and a small quantity of scattering fruit already ripe. Picking coffee all month. Rice ripening, and harvesting in full progress by close of month. Windward pastures in good condition, but leeward pastures short and dry, especially in lower levels.—*Alex. McC. Ashley.*

THE WEATHER OF THE MONTH.

By Mr. WM. B. STOCKMAN, Chief, Division of Meteorological Records.

PRESSURE.

The distribution of mean atmospheric pressure is graphically shown on Chart VIII and the average values and departures from normal are shown in Tables I and V.

The isobars of mean pressure for the month, as a rule, followed the contour of those of the normal for October, but everywhere they were above the normal, except in the extreme southeastern part of Arizona and in the Sacramento Valley and southwestern portions of California.

Departures ranging between +.05 and +.10 inch occurred in New England, the Middle Atlantic and northern part of the South Atlantic States, and generally in a northwesterly direction from the latter two districts to the Pacific Ocean, with a crest showing departures ranging from +.10 to +.14 inch overlying western South Dakota, southwestern North Dakota, Montana, except the northeastern portion, Wyoming, Idaho, except the extreme southern portion, and northern Washington. The minus departures were very slight.

The mean pressure for the month of October, 1905, everywhere showed an increase over the preceding month. To the westward of the ninety-fifth degree of longitude, excepting along the California coast, the changes were greater than +.10 inch; over the northern and middle slope and Plateau regions, more than +.15 inch; over Montana, except the northeastern portion, northern Wyoming, Idaho, and eastern Washington, more than .20 inch, with the crest over northwestern Montana, where they were +.26 inch.

TEMPERATURE OF THE AIR.

The mean temperature for the month was above the normal in the Atlantic and Gulf States, Tennessee, upper Ohio Valley, lower and eastern portion of the upper Lake region, the central portion of the upper Mississippi Valley, Rio Grande Valley, southern Arizona, and extreme southern and northwestern California; elsewhere it was below the normal.

The greatest positive departures, ranging from +2.0° to +2.6°, occurred in southeastern Florida, northeastern Tennessee, northeastern North Carolina, eastern Pennsylvania, and the southwestern half of New York. The minus departures from the normal were more marked, and ranged from —2.0° to —6.2° over the northern portion of the Missouri Valley, North Dakota, and the greater portion of the slope and Plateau regions, the maximum departures occurring in Colorado, northern Utah, northern Idaho, eastern Washington, western Montana, Wyoming, western Nebraska, and southwestern South Dakota.

By geographical districts the mean temperature for the month was below the normal in the north Pacific, Plateau, and slope regions, Missouri and upper Mississippi valleys, and North Dakota. In the remaining geographical districts the mean temperature was above the normal.

The average temperatures for the several geographic districts and the departures from the normal values are shown in the following table:

Average temperatures and departures from normal.

Districts.	Number of stations.	Average temperatures for the current month.	Departures for the current month.	Accumulated departures since January 1.	Average departures since January 1.
		°	°	°	°
New England	8	50.9	+ 1.0	—11.2	—1.1
Middle Atlantic	12	56.3	+ 1.2	— 5.4	—0.5
South Atlantic	10	64.4	+ 1.3	— 1.5	—0.2
Florida Peninsula *	8	74.7	+ 1.6	+ 5.4	+0.5
East Gulf	9	65.9	+ 0.1	— 5.5	—0.6
West Gulf	7	67.5	+ 0.4	— 4.8	—0.5
Ohio Valley and Tennessee	11	56.8	+ 0.4	— 7.4	—0.7
Lower Lake	8	52.4	+ 1.1	— 8.6	—0.9
Upper Lake	10	47.5	+ 0.5	— 3.4	—0.3
North Dakota *	8	40.9	— 2.6	+ 1.3	+0.1
Upper Mississippi Valley	11	51.4	— 1.0	— 7.4	—0.7
Missouri Valley	11	50.2	— 2.2	— 6.2	—0.6
Northern Slope	7	42.0	— 4.0	— 2.1	—0.2
Middle Slope	6	52.4	— 3.0	— 7.4	—0.7
Southern Slope *	6	59.5	— 1.5	—11.1	—1.1
Southern Plateau *	13	59.3	— 0.8	— 4.9	—0.5
Middle Plateau *	8	45.8	— 3.2	+ 1.9	+0.2
Northern Plateau *	12	43.3	— 4.6	+ 9.4	+0.9
North Pacific	7	49.4	— 2.0	+ 8.4	+0.8
Middle Pacific	5	60.2	+ 1.1	+ 8.8	+0.9
South Pacific	4	63.6	+ 0.1	+ 5.9	+0.6

* Regular Weather Bureau and selected cooperative stations.

In Canada.—Prof. R. F. Stupart says:

The mean temperature of October did not differ much from the average in Ontario, Quebec, and the Maritime Provinces, but from Manitoba westward the month was colder than the average; the negative departures from the mean temperature were between 2° and 3° in Manitoba and from 4° to 7° in Saskatchewan, Alberta, and British Columbia, except quite near the coast in southern Vancouver Island, where the departure was only about 2°.

PRECIPITATION.

The distribution of total monthly precipitation is shown on Chart III.

The total precipitation for the month was above the normal in the following geographical districts: east Gulf States, Ohio Valley and Tennessee, upper Mississippi and Missouri valleys, and the northern slope and north Pacific regions. In the northern Plateau region it was normal and below normal in the remaining geographical districts.

Deficiencies of 3.0 to 3.6 inches were reported from the New England coast; of 2.0 to 3.0 inches from central New England, the southern portion of the Middle Atlantic and northern portion of the South Atlantic States, the coast of Texas, and the Florida Peninsula, and 5.3 inches on the southeastern coast of Florida. There was an excess in precipitation of 2.0 inches or more about eastern Lake Ontario, southern Ohio, northwestern West Virginia, north-central Kentucky, extreme western Florida, Mississippi generally, eastern Louisiana, southwestern Tennessee, northwestern Arkansas, northeastern Missouri, and central Texas; and of 3.0 to 3.4 inches in southern and western Mississippi, extreme southwestern Tennessee, central Missouri, and northwestern West Virginia.

Snow occurred in northern New England, except along the coast, New York, the Lake region, in the mountain districts of Pennsylvania, Maryland, and West Virginia, the northern and central portions of Indiana and Illinois, upper Mississippi and Missouri valleys, North Dakota, the northern slope and Plateau, and generally over the middle Plateau and slope regions.

Average precipitation and departure from the normal.

Districts.	Number of stations.	Average.		Departure.	
		Current month.	Percentage of normal.	Current month.	Accumulated since Jan. 1.
		Inches.		*Inches.*	*Inches.*
New England	8	1.31	34	—2.5	—5.0
Middle Atlantic	12	2.40	75	—0.8	—1.4
South Atlantic	10	2.24	60	—1.5	—7.3
Florida Peninsula *	8	2.53	55	—2.1	+8.1
East Gulf	9	4.50	167	+1.8	+2.7
West Gulf	7	2.73	96	—0.1	+2.1
Ohio Valley and Tennessee	11	4.77	185	+2.2	—0.8
Lower Lake	8	2.95	97	—0.1	—1.2
Upper Lake	10	2.81	93	—0.2	+0.8
North Dakota *	8	0.39	33	—0.8	+1.3
Upper Mississippi Valley	11	3.29	138	+0.9	—0.1
Missouri Valley	11	2.66	136	+0.7	+5.9
Northern Slope	7	0.96	126	+0.2	+2.8
Middle Slope	6	1.29	87	—0.2	+4.5
Southern Slope *	6	1.33	69	—0.6	+6.3
Southern Plateau *	13	0.37	55	—0.3	+5.5
Middle Plateau *	8	0.31	31	—0.7	+1.1
Northern Plateau *	12	0.29	100	0.0	—1.4
North Pacific	7	4.92	109	+0.4	—6.2
Middle Pacific	5	0.42	26	—1.2	—4.4
South Pacific	4	0.08	12	—0.6	+2.5

* Regular Weather Bureau and selected cooperative stations.

In Canada.—Professor Stupart says:

The precipitation was in excess of the average near the coast in British Columbia and also over the larger part of Ontario, while in all other portions of Canada there was a deficiency, which was especially marked in the Maritime Provinces, where the rainfall for the month was scarcely over a quarter of the average amount. In Manitoba and the other Northwest Provinces the deficiency in precipitation was also pronounced, the whole amounting in most districts to considerably less than 1.0 inch, part of which was snow.

HUMIDITY.

The relative humidity was normal in the Florida Peninsula and North Dakota; below normal in the Atlantic States, Lake region, middle Plateau, and middle and south Pacific regions. In the remaining geographical districts it was above the normal.

The averages by districts appear in the following table:

Average relative humidity and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
	%			%	
New England	73	— 6	Missouri Valley	70	+ 3
Middle Atlantic	74	— 2	Northern Slope	68	+ 8
South Atlantic	77	— 1	Middle Slope	65	+ 6
Florida Peninsula	80	0	Southern Slope	68	+ 5
East Gulf	79	+ 6	Southern Plateau	47	+ 3
West Gulf	75	+ 3	Middle Plateau	47	— 4
Ohio Valley and Tennessee	76	+ 5	Northern Plateau	63	+ 3
Lower Lake	73	— 1	North Pacific	81	+ 1
Upper Lake	75	— 3	Middle Pacific	58	— 8
North Dakota	72	0	South Pacific	64	— 6
Upper Mississippi Valley	75	+ 4			

WIND.

The maximum wind velocity at each Weather Bureau station for a period of five minutes is given in Table I, which also gives the altitude of Weather Bureau anemometers above ground.

Following are the velocities of 50 miles and over per hour registered during the month:

Maximum wind velocities.

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
Alpena, Mich.	20	52	e.	North Head, Wash	1	60	se.
Buffalo, N. Y	20	73	w.	Do	2	58	s.
Cleveland, Ohio	20	54	w.	Do	5	55	se.
Columbus, Ohio	20	50	sw.	Do	6	74	s.
Dodge, Kans	13	56	s.	Do	14	50	se.
Green Bay, Wis	19	52	ne.	Do	17	54	nw.
Mount Tamalpais, Cal	15	51	nw.	Tatoosh Island, Wash	6	80	sw.
Mount Weather, Va	11	52	nw.	Do	24	58	s.
Do	12	51	nw.	Do	29	52	e.
Do	21	51	nw.	Do	30	54	e.

CLEAR SKY AND CLOUDINESS.

The cloudiness was above the average in the South Atlantic and Gulf States, Florida Peninsula, Ohio Valley and Tennessee, lower Lake region, North Dakota, the upper Mississippi and Missouri valleys and the slope region. It was below the average in the remaining geographical districts.

The distribution of clear sky is graphically shown on Chart IV, and the numerical values of average daylight cloudiness, both for individual stations and by geographic districts, appear in Table I.

The averages for the various districts, with departures from the normal, are shown in the following table:

Average cloudiness and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
New England	4.3	− 1.2	Missouri Valley	4.7	+ 0.8
Middle Atlantic	4.5	− 0.3	Northern Slope	4.7	+ 0.5
South Atlantic	5.3	+ 1.3	Middle Slope	4.4	+ 1.3
Florida Peninsula	4.9	+ 0.2	Southern Slope	5.4	+ 2.6
East Gulf	5.8	+ 2.2	Southern Plateau	1.7	− 0.2
West Gulf	4.8	+ 1.2	Middle Plateau	2.0	− 1.1
Ohio Valley and Tennessee	5.2	+ 0.7	Northern Plateau	5.0	− 0.7
Lower Lake	5.9	+ 0.1	North Pacific	6.1	− 0.1
Upper Lake	5.9	− 0.2	Middle Pacific	2.4	− 0.6
North Dakota	6.0	+ 0.9	South Pacific	1.8	− 1.2
Upper Mississippi Valley	4.9	+ 0.5			

DESCRIPTION OF TABLES AND CHARTS.

By Mr. WM. B. STOCKMAN, Chief, Division of Meteorological Records.

For description of tables and charts see page 20 of REVIEW for January, 1905.

TABLE I.—*Climatological data for U. S. Weather Bureau stations, October, 1905.*

Stations.	Elevation of instruments.			Pressure, in inches.			Temperature of the air, in degrees Fahrenheit.									Mean wet thermometer.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.			Wind.					Clear days.	Partly cloudy days.	Cloudy days.	Average cloudiness, tenths.	Total snowfall.
	Barometer above sea level, feet.	Thermometers above ground.	Anemometer above ground.	Actual, reduced to mean of 24 hours.	Sea level, reduced to mean of 24 hrs.	Departure from normal.	Mean max. + mean min. ÷ 2.	Departure from normal.	Maximum.	Date.	Mean maximum.	Minimum.	Date.	Mean minimum.	Greatest daily range.				Total.	Departure from normal.	Days with .01, or more.	Total movement, miles.	Prevailing direction.	Maximum velocity. Miles per hour.	Maximum velocity. Direction.	Maximum velocity. Date.					
New England.							50.9	+ 1.0										73	1.31	— 2.5									4.3	
Eastport	76	69	82	29.96	30.05	+ .05	46.8	0.0	69	5	53	27	26	40	25	43	39	76	0.47	— 3.6	5	7,663	w.	36	e.	20	11	12	8	5.3	
Portland, Me.	103	81	117	29.96	30.08	+ .04	49.2	+ 0.1	75	8	58	28	26	41	33	43	38	71	0.95	— 3.0	4	6,159	sw.	38	e.	12	16	9	6	3.9	
Concord	288	70	79	29.78	30.10	+ .05	48.1	— 1.4	77	8	60	19	26	36	46	...	...	...	1.11	— 2.4	5	3,612	nw.	22	w.	21	14	9	8	4.5	
Northfield	876	16	60	29.13	30.10	+ .06	45.0	+ 1.7	77	2	56	15	26	34	43	40	36	77	1.52	— 0.8	8	6,113	s.	34	sw.	20	10	13	8	4.8	
Boston	125	115	181	29.96	30.10	+ .05	53.6	+ 1.7	80	5	62	32	27	46	29	47	42	67	0.82	— 3.5	4	7,155	w.	28	w.	21	17	7	7	3.9	
Nantucket	12	14	90	30.08	30.10	+ .05	55.2	+ 2.6	74	4	61	41	22	50	19	50	46	76	2.06	— 1.9	7	11,558	sw.	40	se.	12	15	12	4	4.3	
Block Island	26	11	46	30.08	30.11	+ .06	55.0	+ 1.4	72	5	60	38	27	50	17	50	46	76	1.37	— 3.1	6	11,913	sw.	42	w.	20	12	13	6	4.4	
Providence	159	57	67	29.93	30.11	+ .06	52.8	.....	80	5	63	29	27	43	34	47	42	70	1.88	.....	5	4,497	w.	27	se.	12	19	5	7	4.1	
Hartford	159	115	132	29.93	30.11	+ .05	53.1	.....	80	5	63	26	27	43	31	46	41	69	2.23	.....	7	4,377	s.	26	sw.	20	17	7	7	4.0	
New Haven	106	116	154	30.00	30.11	+ .05	54.1	+ 1.7	80	5	63	28	27	45	27	48	44	71	2.21	— 1.8	7	6,367	n.	36	s.	12	18	6	7	4.1	
Mid. Atlantic States.							56.3	+ 1.2										74	2.40	— 0.8									4.5	
Albany	97	102	115	29.99	30.10	+ .04	52.0	+ 1.1	83	1	62	26	30	42	33	46	42	74	2.38	— 0.8	10	5,099	s.	40	se.	11	13	8	10	4.7	
Binghamton	875	79	90	29.17	30.11	+ .05	50.0	+ 1.9	87	1	61	23	30	39	38	...	...	...	3.00	+ 0.1	11	4,007	w.	30	s.	20	13	4	14	5.4	
New York	314	108	350	29.78	30.11	+ .05	56.9	+ 1.9	80	9	64	37	27	50	22	51	47	73	2.67	— 0.8	8	8,605	w.	48	nw.	21	15	10	6	3.8	
Harrisburg	374	94	104	29.74	30.14	+ .06	55.2	+ 2.7	85	1	64	32	30	46	30	49	44	72	3.65	+ 0.6	5	4,338	w.	26	sw.	20	12	9	10	4.7	
Philadelphia	117	116	184	30.01	30.13	+ .06	57.9	+ 2.1	86	1	66	36	27	50	29	51	46	69	4.07	+ 1.2	8	7,093	sw.	33	nw.	11	13	11	7	4.4	
Scranton	805	111	119	29.25	30.12	+ .05	52.8	.....	87	1	63	27	30	42	35	47	43	74	3.12	.....	10	5,123	sw.	30	sw.	20	15	6	10	4.6	
Atlantic City	52	39	48	30.07	30.13	+ .06	57.6	+ 1.3	83	1	65	35	22	50	28	53	49	74	1.02	— 2.3	5	6,277	nw.	36	se.	11	12	10	9	4.9	
Cape May	17	48	52	30.13	30.15	+ .08	58.6	— 0.3	82	1	65	40	30	52	20	54	...	...	1.32	— 2.3	5	6,511	w.	36	se.	11	14	11	6	4.2	
Baltimore	123	69	117	30.00	30.13	+ .05	58.2	+ 1.3	87	1	67	36	30	49	32	51	46	70	2.04	— 0.9	6	4,993	w.	30	nw.	11	12	8	11	5.1	
Washington	112	59	76	30.01	30.13	+ .05	56.9	+ 0.7	88	1	68	33	22	46	38	51	48	78	2.30	— 0.8	6	4,057	s.	32	nw.	20	15	10	6	4.4	
Lynchburg	681	83	88	29.40	30.15	+ .06	56.8	— 0.3	88	2	69	31	22	45	40	50	48	81	2.46	— 0.8	9	2,289	ne.	24	nw.	11	15	12	4	4.3	
Mount Weather	1,725	10	57	28.31	30.14	+ .05	53.6	.....	82	1	61	32	22	46	23	47	42	69	3.31	.....	9	11,275	nw.	52	nw.	11	13	10	8	4.7	
Norfolk	91	102	111	30.04	30.14	+ .07	62.5	+ 1.9	88	2	70	42	13	55	28	56	52	75	1.78	— 2.1	7	6,231	ne.	33	s.	11	15	6	10	4.4	
Richmond	144	145	153	30.00	30.16	+ .08	59.4	.....	87	2	70	38	30	49	36	...	...	...	1.24	.....	5	5,289	s.	29	sw.	11	15	8	8	4.3	
Wytheville	2,293	40	47	27.76	30.16	+ .07	53.4	0.0	80	2	66	24	22	41	40	47	44	84	2.13	— 0.6	9	2,838	e.	22	w.	11	16	7	8	4.3	
S. Atlantic States.							64.4	+ 1.3										77	2.24	— 1.5									5.3	
Asheville	2,255	53	75	27.80	30.16	+ .07	55.6	+ 1.0	80	4	66	26	22	45	36	48	44	76	1.93	— 0.8	8	4,919	se.	34	nw.	11	16	5	10	4.5	
Charlotte	773	68	76	29.31	30.15	+ .07	60.9	+ 0.6	86	1	71	38	22	51	30	53	48	69	0.70	— 3.0	7	4,292	ne.	24	s.	11	12	9	10	4.8	
Hatteras	11	12	47	30.10	30.11	+ .05	66.5	+ 2.0	83	1	72	50	13	61	23	61	59	79	3.05	— 3.1	7	10,256	ne.	48	nw.	11	14	9	8	4.5	
Raleigh	376	71	79	29.74	30.14	+ .07	60.6	+ 2.6	86	2	71	37	13	50	32	54	50	74	2.05	— 1.3	9	4,205	n.	28	nw.	11	11	9	11	5.0	
Wilmington	78	82	90	30.01	30.10	+ .04	64.3	+ 0.8	86	2	73	40	23	55	27	59	56	81	3.80	0.0	10	5,428	n.	26	sw.	11	11	14	6	5.0	
Charleston	48	14	92	30.05	30.10	+ .04	68.0	+ 1.3	84	3	74	49	23	62	22	62	59	79	2.63	— 1.6	5	8,455	n.	34	ne.	7	8	13	10	6.0	
Columbia, S. C.	351	41	57	29.74	30.12	+ .05	64.2	+ 0.6	89	1	74	40	23	54	34	57	53	74	1.43	— 1.0	7	4,492	ne.	20	ne.	21	10	13	8	5.2	
Augusta	180	89	97	29.91	30.11	+ .04	65.6	+ 1.9	89	2	76	39	24	56	36	58	54	75	1.00	— 1.5	5	4,363	ne.	26	nw.	11	11	13	7	4.4	
Savannah	65	81	89	30.02	30.09	+ .04	68.0	+ 1.6	87	20	76	46	22	60	24	62	59	81	2.88	— 0.7	7	5,496	n.	21	w.	11	7	10	14	6.2	
Jacksonville	43	101	129	29.99	30.04	+ .02	70.4	+ 0.7	86	20	76	52	12	64	22	65	63	82	2.89	— 2.3	13	7,120	ne.	31	ne.	7	5	11	15	7.0	
Florida Peninsula.							77.8	+ 2.1										80	3.16	— 3.0									4.9	
Jupiter	28	10	48	29.94	29.97	+ .01	78.4	+ 3.0	89	11	84	66	23	73	16	73	71	79	4.26	— 5.3	16	8,864	e.	30	ne.	6	1	27	3	5.6	
Key West	22	10	53	29.92	29.94	.00	80.1	+ 1.6	87	11	84	72	1	76	12	74	72	80	4.09	— 1.2	15	6,937	ne.	25	w.	26	9	17	5	4.8	
Tampa	34	79	96	29.96	29.99	+ .01	74.9	+ 1.8	88	1	83	56	13	67	25	68	65	80	1.13	— 2.6	5	6,355	ne.	30	ne.	7	12	13	6	4.4	
East Gulf States.							65.9	+ 0.1										79	4.50	+ 1.8									5.8	
Atlanta	1,174	190	216	28.88	30.12	+ .05	61.6	— 0.6	83	2	70	38	22	54	27	56	52	76	2.12	— 0.2	4	8,236	ne.	45	nw.	11	12	6	13	5.5	
Macon	370	55	66	29.71	30.10	+ .04	65.0	.....	85	2	74	38	22	56	33	...	...	...	1.62	.....	5	4,416	ne.	25	ne.	7	7	10	14	6.3	
Pensacola	56	79	96	29.99	30.05	+ .02	69.0	— 0.2	86	3	76	47	22	62	22	...	...	...	5.60	+ 2.3	10	8,131	ne.	36	e.	9	10	6	15	6.0	
Birmingham	700	136	143	29.33	30.10	+ .03	63.5	— 1.6	84	6	71	37	21	56	28	...	...	...	1.50	— 1.5	8	6,234	se.	29	se.	10	9	8	14	6.0	
Mobile	57	88	96	29.99	30.05	+ .01	68.5	+ 1.1	88	3	76	45	22	60	27	63	60	81	7.32	+ 3.9	9	4,381	ne.	26	n.	11	8	14	9	5.5	
Montgomery	223	100	112	29.84	30.09	+ .03	65.6	+ 0.4	87	2	74	41	21	57	30	59	56	80	3.87	+ 1.5	7	4,976	ne.	24	nw.	11	12	6	13	5.5	
Meridian	375	84	93	29.67	30.07	+ .01	63.8	+ 1.6	88	2	73	35	23	55	35	...	...	...	3.30	+ 1.6	7	4,198	n.	20	e.	7	7	8	16	6.3	
Vicksburg	247	62	74	29.78	30.07	+ .01	65.5	+ 0.2	85	2	74	40	22	57	26	59	56	80	6.23	+ 3.6	11	4,864	ne.	23	e.	9	8	11	12	5.7	
New Orleans	51	88	121	29.98	30.03	.00	69.9	+ 0.1	88	2	76	51	21	64	20	64	61	80	5.95	+ 2.8	10	7,077	ne.	37	ne.	8	10	12	9	5.5	
West Gulf States.							67.5	+ 0.4										75	2.73	— 0.1									4.8	
Shreveport	249	77	84	29.80	30.08	+ .03	66.0	+ 0.7	90	2	75	40	21	57	30	59	56	78	3.91	+ 0.8	5	5,007	ne.	22	nw.	10	15	8	8	4.4	
Fort Smith	457	79	94	29.59	30.08	+ .03	61.0	— 0.1	83	6	71	35	21	52	36	54	50	74	5.10	+ 2.3	11	5,954	e.	28	n.	10	14	7	10	4.6	
Little Rock	357	93	100	29.72	30.10	+ .04	62.4	+ 0.1	85	1	71	40	22	54	31	56	52	73	3.47	+ 1.0	8	5,466	ne.	30	nw.	10	15	7	9	4.7	
Corpus Christi	20	48	53	29.99	30.01	+ .01	73.8	+ 1.3	90	19	80	48	20	68	24	67	64	76	0.25	— 2.0	5	7,653	n.	28	ne.	11	12	13	6	4.7	
Fort Worth	670	106	114	29.36	30.07	+ .04	65.0	.....	91	1	75	37	21	55	31	...	...	...	4.21	.....	7	7,293	s.	37	s.	16	11	14	6	4.7	
Galveston	54	106	112	29.98	30.04	+ .01	72.1	— 0.2	86	1	77	50	21	67	21	66	63	77	1.07	— 3.2	5	9,126	ne.	39	ne.	5	14	11	6	4.2	
Palestine	510	73	79	29.51	30.04	+ .01	66.8	+ 0.3	92	1	76	41	21	58	30	59	56	76	3.47	+ 0.2	6	5,531	ne.	23	sw.	14	10	10	11	5.8	
San Antonio	701	80	91	29.30	30.02	+ .01	70.6	+ 0.9	94	1	80	45	26	61	32	61	56	68	1.83	+ 0.2	6	5,316	ne.	28	n.	20	14	7	10	5.1	
Taylor	583	55	63	29.42	30.04	+ .02	68.6	.....	95	1	78	43	26	59	33	...	...	...	2.40	.....	7	5,950	n.	29	s.	14	12	6	13	5.3	
Ohio Val. and Tenn.							56.8	+ 0.4										76	4.77	+ 2.2									5.2	
Chattanooga	762	106	112	29.33	30.14	+ .05	61.4	+ 0.9	82	6	70	36	22	52	31	55	51	77	4.66	+ 2.0	9	4,336	ne.	30	w.	10	13	7	11	4.9	
Knoxville	1,004	35	88	29.08	30.14	+ .05	59.6	+ 2.0	86	2	70	33	22	49	35	53	50	80	4.55	+ 1.8	9	3,942	ne.	34	nw.	20	13	9	9	5.0	
Memphis	399	76	97	29.69	30.12	+ .05	62.4	+ 0.8	85	7	71	39	22	54	24	56	53	78	7.01	+ 4.2	6	5,990	s.	40	nw.	11	14	5	12	4.5	
Nashville	546	79	91	29.55	30.14	+ .06	60.6	+ 1.0	86	1	70	32	22	51	32	53	50	75	3.56	+ 1.1	8	3,885	se.	26	s.	18	12	7	12	5.2	
Lexington	989	75	102	29.06	30.14	+ .06	55.4	— 0.4	81	8	64	33	12	46	34	...	...	...	3.45	+ 1.2	10	7,069	ne.	44	w.	11	15	4	12	4.8	T.
Louisville	525	114	136	29.56	30.14	+ .06	57.2	— 0.5	85	8	67	35	22	48	36	51	46	73	5.72	+ 2.9	9	5,552	n.	35	sw.	19	14	4	13	5.2	
Evansville	431	72	82	29.64	30.12	+ .04	57.8	.....	85	8	67	36	12	48	29	...	...	...	7.08	.....	10	5,025	ne.	26	s.	19	13	9	9	4.6	
Indianapolis	822	154	164	29.23	30.13	+ .06	54.0	— 0.4	83	8	63	31	26	45	33	47	43	72	4.24	+ 1.4	13	6,551	se.	35	sw.	15	9	11	11	5.5	
Cincinnati	628	152	160	29.45	30.14	+ .06	55.7	— 0.7	84	1	66	32	23	46	37	49	44	70	4.85	+ 2.4	10	4,490	ne.	28	w.	20	11	8	12	5.3	
Columbus	824	173	190	29.24	30.13	+ .05	53.7	0.0	80	9	63	30	30	45	38	48	46	81	5.45	+ 2.8	10	7,483	sw.	50	sw.	20	11	8	12	5.5	
Pittsburg	842	336	352	29.22	30.13	+ .05	54.8	+ 0.1	79	9	64	34	30	46	35	48	43	72	3.54	+ 1.1	12	7,046	sw.	44	sw.	20	9	10	12	5.4	
Parkersburg	638	77	84	29.48	30.15	+ .07	55.2	+ 0.1	81	18	65	31	22	46	38	48	45	78	6.48	+ 4.4	12	3,590	s.	28	w.	11	9	6	16	6.2	
Elkins	1,940	41	50	28.10	30.18	+ .08	52.0	+ 1.3	86	9	66	21	22	38	50	44	42	83	3.70	+ 1.7	13	2,624	w.	22	w.	20	11	12	8	4.9	0.3
Lower Lake Region.							52.4	+ 1.1										73	2.95	— 0.1									5.9	
Buffalo	767	178	206	29.24	30.08	+ .03	52.6	+ 2.3	81	1	60	27	26	46	28	47	42	73	4.54	+ 0.9	11	9,852	sw.	73	w.	20	5	12	14	6.4	T.
Oswego	335	76	91	29.70	30.07	+ .02	51.2	+ 1.2	79	1	59	27	30	44	27	46	41	73	5.26	+ 2.0	12	7,921	s.	40	nw.	21	10	5	16	5.5	T.
Rochester	523	81	102	29.52	30.10	+ .05	52.0	+ 2.4	85	1	61	28	26	43	33	45	41	73	3.16	+ 0.2	9	6,115	sw.	38	sw.	20	11	4	16	5.9	T.
Syracuse	597	97	113	29.45	30.10	+ .04	51.1	.....	85	1	59	25	26	43	29	...	...	...	3.11	.....	9	7,979	s.	43	sw.	20	12	6	13	5.0	0.4	T.
Erie	713	92	102	29.31	30.09	+ .04	53.3	+ 1.1	77	10	61	30	26	46	27	46	41	69	3.98	— 0.1	11	8,309	s.	40	w.	20	9	7	15	6.2	T.	
Cleveland	762	190	201	29.27	30.10	+ .04	52.7	+ 0.5	78	4	60	31	26	46	29	48	45	77	2.92	0.0	11	11,543	se.	54	w.	20	8	4	19	6.6	0.8	
Sandusky	629	62	70	29.42	30.11	+ .05	53.0	— 0.2	80	4	61	33	30	45	35	...	...	...	1.49	— 1.3	11	6,151	sw.	36	nw.	20	10	4	17	5.9		
Toledo	628	120	127	29.42	30.11	+ .06	52.2	+ 0.1	83	8	61	26	29	43	36	46	42	73	1.10	— 1.3	9	7,369	sw.	36	sw.	20	9	7	15	5.8		
Detroit	730	153	193	29.30	30.10	+ .05	52.1	+ 1.1	81	4	60	28	29	44	31	46	42	74	1.15	— 1.4	9	8,423	sw.	44	sw.	20	8	9	14	5.9		
Upper Lake Region.							47.5	+ 0.5										75	2.81	— 0.2									5.9	
Alpena	609	13	92	29.38	30.05	+ .02	47.2	+ 2.0	85	4	56	23	25	38	33	43	40	81	1.85	— 2.0	13	8,388	nw.	52	e.	20	8	10	13	5.9	T.	
Escanaba	612	40	48	29.36	30.03	+ .02	44.8	+ 0.1	86	4	54	16	29	36	35	41	37	77	3.19	— 0.1	9	6,183	nw.	37	ne.	19	11	8	12	5.2	0.9	
Grand Rapids	707	127	165	29.31	30.08	+ .05	50.2	— 0.6	82	9	59	23	29	42	30	45	41	77	4.41	+ 1.8	13	8,449	nw.	48	w.	20	8	8	15	6.3	T.	
Houghton	668	66	74	29.25	29.99	— .01	44.0	.....	81	7	51	18	29	37	32	...	...	...	4.08	.....	20	5,656	nw.	26	w.	10	10	4	17	6.4	5.7	
Marquette	734	76	116	29.20	30.02	+ .01	44.9	— 0.2	83	7	53	21	29	37	31	39	34	72	2.19	— 1.1	18	9,085	w.	48	sw.	7	10	6	15	5.8	1.4	
Port Huron	638	70	120	29.38	30.08	+ .04	50.9	+ 2.0	82	8	60	26	29	42	31	45	41	77	3.21	+ 0.4	11	8,393	sw.	40	sw.	20	10	7	14	5.9	T.	
Sault Ste. Marie	614	40	61	29.33	30.03	+ .02	44.2	+ 1.5	79	9	51	25	25	37	33	40	37	80	2.60	— 0.9	18	6,657	nw.	36	w.	16	7	7	17	7.1	3.8	
Chicago	823	140	310	29.20	30.10	+ .06	53.4	+ 1.4	83	8	61	29	28	46	31	47	41	69	1.82	— 1.1	8	11,717	sw.	48	w.	19	10	11	10	5.5	T.	
Milwaukee	681	124	142	29.34	30.09	+ .06	50.4	+ 1.2	85	4	58	26	28	42	36	44	38	69	3.59	+ 1.2	6	7,842	w.	40	s.	17	13	6	12	4.9	T.	
Green Bay	617	49	86	29.37	30.04	+ .02	47.6	+ 0.7	83	4	56	22	29	39	29	42	37	74	2.71	0.0	9	7,814	sw.	52	ne.	19	11	6	14	6.1	1.0	
Duluth	1,133	11	47	28.77	30.01	+ .01	41.0	— 2.8	79	7	48	12	28	34	31	36	32	78	2.49	— 0.1	9	10,529	w.	44	nw.	15	12	7	12	5.3	1.0	

TABLE I.—*Climatological data for U. S. Weather Bureau stations, October, 1905*—Continued.

Stations.	Elevation of instruments.			Pressure, in inches.			Temperature of the air, in degrees Fahrenheit.								Mean wet thermometer.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.			Wind.				Clear days.	Partly cloudy days.	Cloudy days.	Average cloudiness, tenths.	Total snowfall.
	Barometer above sea level, feet.	Thermometers above ground.	Anemometer above ground.	Actual, reduced to mean of 24 hours.	Sea level, reduced to mean of 24 hrs.	Departure from normal.	Mean max. + mean min. ÷ 2.	Departure from normal.	Maximum.	Date.	Mean maximum.	Minimum.	Date.	Mean minimum.	Greatest daily range.			Total.	Departure from normal.	Days with .01, or more.	Total movement, miles.	Prevailing direction.	Maximum velocity. Miles per hour.	Maximum velocity. Direction.	Maximum velocity. Date.				
North Dakota.							40.7	— 2.7									72	0.36	— 0.9								6.0	
Moorhead	935	8	57	29.03	30.06	+ .06	42.0	— 1.1	84	8	52	13	29	32	36	36	33	79	0.72	— 1.2	5	5,737	nw.	34	sw.	8	8	12	11	5.8	T.
Bismarck	1,674	16	57	28.27	30.09	+ .10	40.4	— 3.4	84	3	52	11	30	29	38	34	28	68	0.30	— 0.7	4	7,336	nw.	41	w.	1	11	7	13	5.7	2.7
Devils Lake	1,482	11	44	28.44	30.04	+ .05	38.2	.....	83	6	49	2	28	27	39	32	27	71	0.08	.....	4	9,721	w.	48	w.	1	5	9	17	6.5	0.4
Williston	1,875	14	44	28.04	30.06	+ .08	39.6	— 3.6	79	3	51	15	29	28	40	33	27	69	0.06	— 0.9	3	7,939	nw.	42	w.	25	9	11	11	5.8	0.3
Upper Miss. Valley.							51.4	— 1.0									75	3.29	+ 0.9								4.9	
Minneapolis	.....	102	208	.....	.....	.....	45.6	— 2.3	82	4	53	17	28	38	26	...	...	...	2.17	+ 0.4	7	9,387	s.	37	s.	8	11	5	15	5.6	5.5
St. Paul	837	171	179	29.12	30.04	+ .03	46.4	— 0.7	82	4	54	18	30	38	27	41	36	73	2.49	+ 0.6	7	8,209	nw.	33	s.	1	14	8	9	5.4	2.2
La Crosse	714	71	87	29.28	30.06	+ .04	48.0	— 1.5	82	7	56	19	29	40	35	...	...	...	2.29	0.0	10	6,078	s.	30	w.	31	13	6	12	5.1	T.
Madison	974	70	78	29.01	30.07	+ .04	48.8	— 1.6	83	4	57	24	31	40	35	42	37	71	2.25	— 0.2	6	7,638	sw.	42	nw.	19	14	8	9	4.5	T.
Charles City	1,015	8	58	28.98	30.08	+ .06	46.8	— 4.8	85	4	57	20	28	37	35	41	38	82	3.23	+ 0.8	8	5,481	nw.	26	se.	17	12	9	10	4.9	0.4
Davenport	606	71	79	29.42	30.09	+ .05	52.6	+ 0.5	84	4	62	25	28	43	30	45	41	70	2.73	+ 0.1	8	5,681	nw.	34	nw.	19	15	7	9	4.2	T.
Des Moines	861	84	101	29.18	30.09	+ .06	50.8	— 1.4	85	4	60	24	31	41	39	45	41	74	3.64	+ 0.6	8	5,887	sw.	32	sw.	8	11	10	10	5.4	0.8
Dubuque	698	100	117	29.53	30.09	+ .05	50.9	+ 0.3	83	4	60	23	29	42	30	44	39	71	3.88	+ 1.2	7	5,246	nw.	28	nw.	19	14	9	8	4.8	
Keokuk	614	63	78	29.42	30.10	+ .05	54.8	+ 0.7	83	5	64	26	28	45	34	48	44	78	3.41	+ 0.6	10	5,651	sw.	36	w.	19	15	7	9	4.0	
Cairo	356	87	93	29.73	30.12	+ .05	59.3	+ 0.6	84	6	68	38	22	50	28	53	50	78	3.00	+ 0.2	10	6,168	n.	34	n.	10	10	11	10	5.2	
La Salle	536	56	64	29.53	30.11	+ .07	51.8	.....	85	8	63	24	28	41	33	...	...	...	1.86	.....	9	5,864	sw.	39	w.	19	11	11	9	5.0	T.
Peoria	609	11	45	29.44	30.12	+ .07	52.3	.....	85	8	64	24	28	41	32	...	...	...	2.77	.....	11	6,372	s.	48	w.	19	17	9	5	3.9	T.
Springfield, Ill.	644	82	93	29.42	30.11	+ .06	54.3	— 0.7	84	5	64	29	28	44	34	48	44	75	3.66	+ 1.0	12	6,605	s.	32	w.	19	13	7	11	4.9	
Hannibal	534	75	109	29.52	30.10	+ .05	54.0	— 1.0	85	5	64	30	12	44	36	...	...	...	3.38	+ 2.0	12	6,594	sw.	36	w.	19	11	7	13	5.2	
St. Louis	567	208	217	29.50	30.11	+ .05	56.4	— 1.1	82	5	64	32	28	48	32	50	46	74	6.64	+ 3.8	13	7,387	s.	36	sw.	14	10	11	10	5.1	T.
Missouri Valley.							60.2	— 2.2									70	2.66	+ 0.7								4.7	
Columbia, Mo.	784	11	84	29.26	30.10	+ .05	54.1	— 3.5	86	5	64	30	28	44	42	...	...	...	6.33	+ 4.2	14	5,501	se.	32	sw.	14	15	7	9	4.5	T.
Kansas City	963	78	95	29.08	30.13	+ .09	55.4	— 0.3	83	5	64	32	31	47	35	48	44	72	2.34	— 1.0	12	5,809	se.	25	nw.	19	17	4	10	4.1	T.
Springfield, Mo	1,324	98	104	28.69	30.10	+ .05	55.3	— 0.7	82	4	64	32	21	47	36	50	46	76	4.46	+ 1.4	13	7,412	se.	37	s.	17	14	6	11	4.9	T.
Topeka	.....	85	89	.....	.....	.....	54.6	— 1.4	83	4	65	28	31	45	39	...	...	...	1.28	— 0.7	12	6,196	s.	31	sw.	14	15	7	9	4.3	T.
Lincoln	1,189	75	84	28.80	30.08	+ .05	51.6	— 2.5	89	4	62	24	31	42	41	44	39	71	2.56	+ 0.5	10	7,641	s.	37	nw.	19	17	2	12	4.4	1.7
Omaha	1,105	115	121	28.90	30.09	+ .06	51.8	— 1.1	87	4	60	27	31	43	36	44	38	67	3.97	+ 1.5	10	6,174	s.	29	nw.	19	16	2	13	4.8	0.9
Valentine	2,598	47	54	27.35	30.10	+ .09	44.4	— 4.8	91	6	58	10	20	31	46	36	30	67	1.61	+ 0.7	7	7,383	nw.	36	sw.	2	12	11	8	4.4	7.2
Sioux City	1,135	96	164	28.84	30.07	+ .05	49.2	— 1.8	86	4	59	24	28	40	45	...	...	...	1.89	+ 0.2	8	9,286	nw.	47	s.	8	15	6	10	4.5	0.9
Pierre	1,572	43	50	28.42	30.11	+ .10	45.2	— 4.2	94	6	56	11	20	35	47	37	30	66	1.64	+ 1.0	7	4,563	se.	25	se.	5	10	12	9	5.2	9.5
Huron	1,306	56	67	28.67	30.09	+ .08	44.2	— 2.3	86	4	56	19	27	32	44	37	32	72	1.73	+ 0.4	9	8,061	nw.	44	s.	6	13	9	9	4.6	1.8
Yankton	1,233	55	65	28.74	30.07	+ .06	48.2	— 1.5	89	4	59	25	22	37	45	...	...	...	1.41	0.0	7	6,689	sw.	38	s.	8	13	4	14	5.6	1.0
Northern Slope.							42.0	— 4.0									68	0.96	+ 0.2								4.7	
Havre	2,505	11	44	27.39	30.07	+ .09	41.4	— 2.6	88	5	54	— 7	19	29	50	35	30	69	0.37	— 0.2	8	7,767	w.	40	w.	6	8	14	9	5.5	1.1
Miles City	2,371	26	48	27.54	30.13	+ .13	44.6	— 1.5	86	5	55	7	19	34	43	37	32	70	0.86	0.0	7	4,400	se.	33	w.	7	12	12	7	4.6	3.4
Helena	4,110	8	56	25.87	30.14	+ .11	39.6	— 5.6	80	5	50	7	18	30	33	26	63	0.47	— 0.4	6	5,205	w.	42	w.	7	11	12	8	5.1	4.4
Kalispell	2,962	11	34	27.03	30.14	+ .13	38.8	.....	62	5	48	8	18	29	28	34	30	77	1.81	.....	10	3,133	nw.	27	sw.	6	10	9	12	5.6	6.4
Rapid City	3,234	46	50	26.66	30.14	+ .13	42.8	— 6.2	86	6	54	14	20	32	40	36	32	72	1.08	+ 0.4	8	4,902	nw.	28	w.	10	16	3	12	4.9	3.8
Cheyenne	6,088	56	64	24.05	30.11	+ .10	40.6	— 4.3	81	6	53	5	31	28	43	32	24	62	1.40	+ 0.7	10	6,620	nw.	40	nw.	8	15	6	10	4.3	13.3
Lander	5,372	26	36	24.70	30.15	+ .11	38.6	— 4.9	79	7	53	2	31	24	44	31	25	67	1.52	+ 0.6	6	2,159	ne.	18	w.	8	13	12	6	4.3	12.5
Yellowstone Park	6,200	11	47	23.92	30.16	+ .14	34.2	.....	69	5	45	4	30	23	37	27	20	63	1.42	.....	9	5,707	sw.	39	sw.	7	14	11	6	4.5	13.7
North Platte	2,821	43	52	27.14	30.10	+ .08	46.6	— 3.2	90	4	61	18	20	32	48	39	34	72	1.05	+ 0.1	6	5,909	w.	36	s.	16	17	3	11	3.9	3.0
Middle Slope.							52.4	— 3.0									65	1.29	— 0.2								4.4	
Denver	5,291	129	136	24.78	30.09	+ .08	46.6	— 3.9	86	6	60	12	31	33	45	36	28	57	2.31	+ 1.4	9	5,623	s.	41	n.	13	18	4	9	3.8	13.8
Pueblo	4,685	80	86	25.32	30.04	+ .05	47.8	— 4.4	88	6	65	16	31	31	52	37	27	51	0.73	0.0	5	4,567	nw.	36	ne.	8	17	10	4	2.7	6.0
Concordia	1,398	42	47	28.62	30.11	+ .08	52.4	— 2.1	88	4	63	25	31	42	47	44	39	71	0.72	— 1.4	8	4,747	s.	26	nw.	19	15	5	11	4.2	1.6
Dodge	2,509	44	54	27.50	30.12	+ .10	53.0	— 2.1	88	4	66	19	20	40	45	44	39	73	1.05	— 0.2	4	7,885	se.	56	s.	13	13	9	9	5.4	1.5
Wichita	1,358	78	86	28.67	30.11	+ .08	55.2	— 2.4	84	7	66	28	20	44	41	47	42	70	1.63	— 0.8	9	6,322	s.	26	s.	13	15	8	8	4.6	2.5
Oklahoma	1,214	79	86	28.79	30.07	+ .04	59.2	— 2.8	84	16	70	32	20	49	35	51	46	69	1.29	— 0.8	6	8,167	s.	37	s.	13	12	8	11	5.4	
Southern Slope.							58.6	— 1.8									68	2.50	— 0.4								5.4	
Abilene	1,738	45	54	28.27	30.07	+ .06	62.6	— 1.9	88	16	72	38	31	53	36	54	49	69	4.66	+ 2.3	9	5,434	se.	32	s.	18	10	8	13	5.5	
Amarillo	3,676	10	49	26.32	30.05	+ .05	54.6	— 1.6	82	16	67	29	20	42	43	46	40	68	0.30	— 1.4	3	8,124	s.	31	se.	8	15	3	13	5.4	
Roswell	3,578	9	57	26.38	30.01	+ .05	56.4	.....	85	8	70	29	20	43	46	48	42	67	0.37	.....	7	4,056	s.	36	nw.	24	9	12	10	5.3	
Southern Plateau.							60.1	— 0.1									47	0.41	— 0.2								1.7	
El Paso	3,762	10	110	26.22	29.96	+ .04	63.8	+ 0.8	88	5	76	37	26	52	39	52	44	57	1.28	+ 0.4	4	7,059	e.	48	sw.	23	16	9	6	3.8	
Santa Fe	7,013	33	39	23.29	30.00	+ .04	48.2	— 1.6	75	5	61	23	20	35	37	37	27	51	1.02	0.0	4	4,442	ne.	25	sw.	14	26	3	2	1.6	
Flagstaff	6,907	12	44	23.38	29.97	+ .05	45.4	— 1.6	74	5	62	17	19	28	46	36	28	60	0.14	— 0.8	2	4,825	sw.	36	sw.	13	27	2	2	1.4	T.
Phoenix	1,108	50	56	28.73	29.87	— .01	71.6	+ 1.8	99	6	87	44	19	56	39	55	42	40	0.00	— 0.4	0	2,665	e.	17	sw.	23	25	6	0	1.7	
Yuma	141	16	46	29.72	29.87	.00	73.3	+ 0.5	101	6	89	49	24	58	37	57	44	41	0.02	— 0.3	1	3,726	nw.	32	n.	9	29	2	0	0.6	
Independence	3,910	11	42	25.99	29.96	+ .01	58.3	— 0.4	87	5	73	33	18	44	36	43	25	32	0.00	— 0.3	0	4,489	nw.	34	nw.	8	29	1	1	1.0	
Middle Plateau.							47.0	— 3.3									47	0.30	— 0.5								2.0	
Carson City	4,720	82	92	25.33	30.05	+ .06	47.2	— 2.4	79	2	64	19	17	30	46	37	25	46	0.00	— 0.4	0	4,080	ne.	44	sw.	7	29	2	0	0.8	
Winnemucca	4,344	18	56	25.69	30.12	+ .07	44.3	— 3.9	83	3	64	11	17	25	53	33	20	44	T.	— 0.4	0	4,685	ne.	34	sw.	7	20	8	3	2.6	
Modena	5,479	10	43	24.64	30.01	+ .05	46.3	— 2.2	78	6	63	13	19	30	43	35	22	44	1.00	+ 0.5	2	7,138	w.	43	n.	8	27	2	2	1.5	T.
Salt Lake City	4,366	105	110	25.68	30.07	+ .06	48.3	— 4.0	81	7	59	25	19	38	39	38	27	46	0.24	— 1.3	4	4,092	se.	44	n.	8	19	10	2	2.9	0.5
Durango	6,546	18	56	23.67	29.99	+ .02	46.9	.....	75	5	64	19	19	30	40	35	24	52	0.12	.....	2	4,510	nw.	27	w.	14	21	9	1	2.0	
Grand Junction	4,608	43	51	25.43	30.03	+ .04	49.0	— 3.8	79	7	63	22	21	35	38	38	27	48	0.27	— 0.9	4	2,865	nw.	23	w.	18	24	5	2	2.2	
Northern Plateau.							45.5	— 4.5									63	1.08	— 0.2								5.0	
Baker City	3,471	52	58	.....	30.15	+ .07	43.1	— 5.0	78	3	54	18	19	32	34	...	...	...	1.02	— 0.1	7	4,813	s.	29	s.	5	15	6	10	....	3.0
Boise	2,739	61	68	27.27	30.16	+ .10	47.4	— 2.0	85	4	59	23	19	36	39	38	29	53	0.57	— 0.4	4	3,113	nw.	30	w.	7	11	13	7	4.7	0.3
Lewiston	757	10	51	29.32	30.14	+ .07	47.0	— 5.8	79	4	56	24	31	38	29	...	...	...	0.68	— 0.6	9	3,739	e.	38	w.	6	11	5	15	5.9	
Pocatello	4,483	46	54	25.56	30.13	+ .09	44.6	— 3.4	80	4	57	17	31	32	39	32	24	51	0.23	— 0.8	2	6,272	e.	46	sw.	7	16	12	3	3.0	2.3
Spokane	1,929	101	110	28.08	30.17	+ .11	42.8	— 5.2	62	3	52	18	31	34	30	38	34	74	2.56	+ 1.0	13	3,888	nw.	40	sw.	6	7	9	15	6.6	T.
Walla Walla	1,000	71	79	29.07	30.16	+ .09	48.2	— 5.8	80	3	57	24	19	39	27	44	40	74	1.41	— 0.1	10	3,553	s.	25	sw.	6	12	16	3	4.6	
N. Pac. Coast Reg.							49.4	— 2.0									81	4.92	+ 0.4								6.1	
North Head	211	11	56	29.89	30.12	+ .07	51.8	— 1.6	73	10	57	38	18	46	19	49	46	85	5.13	— 0.3	17	10,699	e.	74	s.	6	11	7	13	5.6	
Port Crescent	259	12	29	29.84	30.13	+ .11	44.9	— 2.7	57	24	52	27	18	37	23	...	...	...	5.17	+ 1.5	15	4,296	e.	32	s.	6	9	10	12	5.5	
Seattle	123	185	224	30.01	30.15	+ .10	48.6	— 2.9	65	10	55	31	18	43	22	46	44	85	4.29	+ 1.3	14	6,030	se.	48	s.	6	4	11	16	7.2	
Tacoma	213	113	120	29.90	30.13	+ .09	47.4	— 3.2	67	10	55	29	18	40	30	...	...	...	5.50	+ 1.5	14	4,310	n.	34	sw.	6	7	6	18	6.9	
Tatoosh Island	86	7	57	29.98	30.08	+ .07	49.8	— 0.6	58	2	54	38	18	46	11	46	42	78	6.65	— 1.9	15	13,600	e.	80	sw.	6	9	11	11	6.0	
Portland, Oreg.	153	68	96	29.96	30.12	+ .06	51.3	— 2.1	69	2	59	32	18	44	25	47	42	75	4.73	+ 0.7	15	4,442	nw.	26	ne.	30	8	7	16	6.3	
Roseburg	498	9	57	29.56	30.11	+ .03	51.8	— 0.9	82	3	61	34	23	42	31	48	45	81	2.94	+ 0.2	14	2,088	nw.	22	s.	6	9	12	10	5.4	
Mid. Pac. Coast Reg.							50.3	+ 1.1									68	0.42	— 1.2								2.4	
Eureka	62	62	80	30.02	30.10	+ .04	53.2	+ 1.1	73	10	59	40	19	47	22	51	48	85	1.50	— 1.4	4	3,801	n.	36	n.	9	12	11	8	4.6	
Mount Tamalpais	2,375	11	18	27.57	30.03	+ .02	60.7	.....	83	3	68	41	18	54	21	47	34	43	0.00	.....	0	10,763	nw.	51	nw.	15	24	5	2	1.8	
Red Bluff	332	50	56	29.64	30.00	— .03	64.8	+ 1.3	90	3	78	41	23	51	37	51	36	40	0.19	— 1.2	1	4,263	n.	26	n.	13	22	7	2	2.3	
Sacramento	69	106	117	29.91	29.98	— .01	62.6	+ 0.8	91	3	77	38	17	48	36	51	40	50	0.00	— 0.9	0	5,282	nw.	38	nw.	8	27	4	0	1.4	
San Francisco	155	161	167	29.87	30.04	+ .03	60.4	+ 1.1	84	10	68	49	12	53	27	53	47	72	T.	— 1.2	0	5,643	w.	30	w.	4	25	5	1	2.0	
S. Pac. Coast Reg.							63.6	+ 0.1									64	0.08	— 0.6								1.8	
Fresno	330	67	70	29.62	29.98	+ .02	63.6	— 1.3	96	4	80	38	17	48	40	50	36	44	0.00	— 0.5	0	3,249	nw.	24	nw.	7	27	2	2	1.1	
Los Angeles	338	116	123	29.58	29.95	.00	65.8	+ 2.1	96	3	78	46	27	54	37	55	50	68	0.08	— 0.7	2	3,396	w.	19	sw.	14	22	5	4	2.2	
San Diego	87	94	102	29.85	29.94	— .01	63.8	+ 0.6	85	3	70	50	27	58	22	58	54	75	0.25	— 0.2	3	3,881	nw.	20	nw.	3	27	3	1	2.1	
San Luis Obispo	201	47	54	29.77	29.99	.00	61.1	— 0.9	93	2	76	36	16	46	42	52	46	68	T.	— 1.0	0	3,459	n.	28	ne.	1	24	3	4	2.0	
West Indies.																												
Grand Turk	11	6	20	29.88	29.89	— .02	81.0	.....	90	11	87	69	3	75	17	...	...	...	8.08	.....	15	.....	e.	...	.....	...	.....	...	...	
San Juan	82	48	90	29.82	29.90	.00	79.8	— 0.6	91	12	86	71	28	74	17	75	73	82	10.25	+ 4.1	20	6,359	se.	44	s.	4	10	17	4	4.5	

* More than one date.

TABLE II.—*Climatological record of cooperative observers, October, 1905.*

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Alabama.	°	°	°	*Ins.*	*Ins.*
Alaga				5.22	
Anniston	86[c]	29[a]	58.2[c]	2.80	
Ashville	83	31	61.8	4.90	
Benton				4.92	
Bermuda	90	38	65.9	6.56	
Boligee	90	34	65.6	5.35	
Bridgeport				5.23	
Burkeville				4.75	
Calera				4.25	
Camp Hill	87	36	64.1	3.05	
Citronelle	89	41	68.2	5.30	
Clanton	89	34	63.2	4.40	
Cordova	89	31	64.2	4.47	
Dadeville				3.40	
Daphne	88	44	69.2	6.90	
Decatur	85	37	62.8	7.27	
Delmar	84	32	63.0	5.00	
Demopolis				4.26	
Eufaula	85	33	64.6	2.62	
Evergreen	88[f]	40	66.2[c]	3.33	
Flomaton	90	37	69.2	7.90	
Florence	86	34	62.6	5.02	
Fort Deposit	86	40	64.6	3.06	
Gadsden	89	36	63.1	4.38	
Goodwater	86	37	63.2	4.91	
Greensboro	86	39	65.4	4.40	
Greenville				4.45	
Guntersville				4.66	
Hamilton	89	33	63.2	3.85	
Highland	89	38	65.3	3.16	
Letohatchie				0.97	
Livingston	87	36	64.0	5.54	
Lock No. 4	89	34	63.3	3.79	
Lucy	89	36	67.8	7.37	
Madison Station	89	35	63.8	8.33	
Maplegrove	86	32	61.8	5.59	
Marion	86	39	64.4	4.21	
Milstead				4.04	
Newbern	88	35	65.0	3.85	
Notasulga				1.94	
Oneonta	85	30	61.8	3.43	
Opelika	88	38	64.6	4.43	
Ozark	88	43	66.0	3.37	
Prattville	89	35	65.0	4.73	
Pushmataha	88[b]	33[b]	62.9[b]		
Riverton	86	30	62.0	4.13	
Scottsboro	84	31	62.4	5.78	
Selma	90	40	66.6	4.20	
Springhill	83	42	65.3	8.28	
Talladega	88	38	63.6	2.96	
Tallassee				3.68	
Thomasville	88	36	64.6	4.87	
Tuscaloosa	87	36	63.4	2.56	
Tuscumbia	84	36	61.2	6.59	
Tuskegee	90	40	67.0	3.07	
Union Springs	85	40	65.3	2.85	
Uniontown	89	34	65.3	3.61	
Valleyhead	86	32	62.2	5.13	
Vienna				1.77	
Wetumpka	91	35	66.8	3.06	
Alaska.					
Fort Liscum		26		6.06	4.5
Juneau	56	27	43.6	12.74	
Killisnoo	55	26	42.0	4.10	T.
Loring	55	23	42.6	17.94	4.0
Sitka	57	28	45.8	7.03	
Skagway	55	12	39.9	2.17	
Arizona.					
Allaire Ranch				0.56	
Alpine				1.03	
Arizona Canal Co. Dam	96	43	73.0	0.00	
Aztec[*1]	116	53	83.0	0.00	
Benson	91	32	61.4	0.50	
Blue	79	27	52.6	0.67	
Bowie	95	31	62.7	0.60	
Buckeye	103	37	68.4	T.	
Casagrande	102	47	74.4	0.00	
Cochise[*1]	91	40	62.7	0.30	
Congress	90	49	70.4	0.08	
Douglas	93	34	65.8	1.00	
Dudleyville	95	38	67.4	0.20	
Duncan	99	26	61.2	0.70	
Fort Defiance	74	10	46.0	0.13	T.
Fort Mohave	103	42	69.4	0.40	
Gilabend	105	42	72.6	0.00	
Globe	90	38	65.1	T.	
Grand Canyon	78	18	47.2	0.31	0.5
Greaterville	85	36	61.2	0.47	
Greer				0.51	
Holbrook	85	21	53.6	0.05	
Huachuca Res				0.51	
Jerome	83	39	62.0	0.20	
Kingman	89	36	61.8	0.45	
Maricopa	106	37	71.2	0.00	
Mesa	102	41	71.4	0.00	
Mohawk Summit[*1]	108	64	82.0	0.00	
Natural Bridge				T.	
Nutrioso				0.86	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
***Arizona*—Cont'd.**	°	°	°	*Ins.*	*Ins.*
Oracle	84	43	65.2	0.03	
Phoenix	98	37	69.0	0.00	
Picacho[*1]	99	58	73.1	0.00	
Pinal Ranch				0.15	
Pinto				0.00	
Prescott	89	32	59.4	0.12	
Roosevelt	101	40	71.2	0.00	
San Carlos	96	34	66.2	0.01	
San Simon	90	34	63.5	0.04	
Seligman	84	24	53.0	0.10	
Sentinel[*1]	90	42	64.7	0.00	
Showlow				0.25	
Tempe	102	34	68.6	0.00	
Thatcher	90	34	62.2	T.	
Tombstone	85	39	63.4	0.66	
Tonto	100	32	65.0	0.16	
Tucson	96	40	69.8	0.09	
Upper San Pedro	92	31	64.0	0.60	
Vail[*5]	101	65	78.8	0.00	
Walnut Grove				0.10	
Willcox	90	30	60.0	0.37	
Williams	78	25	52.2	0.23	
Yarnell				0.06	
Young	87	26	55.2	0.75	
Arkansas.					
Alicia	85	30	59.3	3.80	
Amity	88	34	63.0	5.59	
Arkadelphia	86	34	62.8	5.51	
Arkansas City				2.12	
Arnett	79	28	57.7	3.68	
Batesville	86	35	60.8	4.61	
Beebranch	87	31	59.4	4.75	
Blackrock				3.44	
Blanchard Springs	86	32	62.8	6.86	
Brinkley	89	35	62.0	6.39	
Calico Rock				2.50	
Camden	89	35	64.6	5.27	
Clarendon				4.96	
Conway	87	33	62.0	3.02	
Corning	88	31	58.0	4.97	
Dallas	83	33	61.5	8.31	
Dardanelle				5.88	
Des Arc	92	33	62.0	8.00	
Dodd City	83	28	57.8	3.90	
Dutton	82	25	56.6	4.08	
Eldorado	86	37	63.4	6.91	
Elon	90[e]	33[e]	64.4[e]	1.57	
Eureka Springs	84	30	57.8	3.55	
Fayetteville	80	26	59.5	2.94	
Forrest City	85	30	62.4	6.52	
Fulton				3.48	
Hardy	85	33	59.7	3.27	
Heber	88	31	62.8	4.25	
Helena	88	35	62.8	4.05	
Hope	89	36	64.9	3.90	
Howe	88	36	64.9	8.10	
Huntsville	88	27	59.0	5.60	
Jonesboro	77	31	54.3	3.80	
Lacrosse	86	32	58.6	3.08	
Lake Village	87	34	63.7	2.85	
Lonoke	88	33	61.4	3.79	
Lutherville	88	29	58.8	7.31	
Luxora				3.42	
Malvern	88	35	62.1	4.55	
Marked Tree				5.67	
Marvell	88	34	63.0	5.36	
Mossville	78	27	56.0	4.14	
Mountain Home	83[g]	30	57.6[d]	5.32	
New Gascony	88[i]	32[i]	60.0[i]	3.01	
New Lewisville	88[e]	36[e]	65.0[e]	4.21	
Newport	92[f]	34	61.9[e]	4.26	
Oregon	84	24	56.8	3.62	
Osceola	86	32	61.4	6.11	
Ozark	86	32	61.2	5.98	
Perry	80	37	61.2	3.61	
Pinebluff	87	35	61.8	3.59	
Pocahontas	86	34	61.4	3.04	
Pond	85	28	57.4	3.01	
Prescott	86	35	63.1	2.49	
Princeton	87	32	62.5	3.29	
Rison	86	34	63.2	3.17	
Russellville	84	33	59.2	6.22	
Silversprings	84	28	59.0	4.73	
Spielerville	87	34	61.6	4.98	
Stuttgart	89	32	62.8	5.10	
Tate	88	30	62.2	5.60	
Texarkana	83	33	60.9	3.53	
Warren	89	32	63.2	5.28	
White Cliffs				5.81	
Wiggs	87	30	61.4	6.24	
Winchester	90	32	64.2	3.16	
Witts Springs	89	28	57.2	1.65	
California.					
Alturas				0.22	
Angiola	102	29	63.2	T.	
Auburn	90	38	65.1	0.00	
Azusa	100	41	65.8	0.10	
Bagdad	97	48	70.7	0.00	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
***California*—Cont'd.**	°	°	°	*Ins.*	*Ins.*
Bakersfield	100	35	64.2	0.00	
Barber				0.00	
Barstow	95	32	63.8	0.00	
Bear Valley				0.30	
Berkeley	82	39	58.0	0.00	
Bishop	85	22	54.6	0.00	
Blue Canyon	75	25	50.4	0.90	
Bodie	70	— 3	36.6	0.00	
Branscomb	87	30	56.0	0.94	
Brush Creek	84	26	54.0	0.10	
Butte Valley				0.20	
Calexico	100	46	71.8	0.00	
Campbell	89	33	58.8	0.00	
Campo				T.	
Cedarville	87	16	46.0	0.40	T.
Chico	89	38	61.4	0.00	
Claremont	101	42	66.8	0.03	
Cloverdale	94	37	63.3	T.	
Colusa	88	38	62.6	0.00	
Craftonville				0.06	
Crescent City	81	32	52.3	3.60	
Crockers				0.00	
Cuyamaca				T.	
Delta	91	31	59.3	0.31	
Diamond				T.	
Dobbins	93	38	65.5	0.00	
Drytown	89	35	59.8	0.00	
Durham	96	32	62.6	0.00	
Elcajon	101	40	65.6	0.25	
Electra	92	39	64.1	0.00	
Elmwood	99	32	61.5	0.00	
Elsinore	98	40	65.5	0.12	
Emigrant Gap	65	37	48.5	0.00	
Escondido	96	37	65.8	0.13	
Folsom	96	36	64.7	0.00	
Fordyce				0.20	
Fort Ross	73	37	53.9	0.28	
Fruitvale				0.00	
Georgetown	86	35	59.5	T.	
Gilroy (near)	97	30	59.4	0.00	
Grass Valley				0.01	
Greenville	84	15	48.2	0.16	
Hanford	98	31	63.2	0.00	
Healdsburg	99	31[g]	63.0[d]	0.00	
Hollister	96	31	60.4	0.00	
Indio	106	45	75.2	T.	
Idylwild	83	22	54.2	T.	
Imperial	107	44	72.2	0.00	
Iowa Hill	85	37	61.2	0.00	
Irvine				0.10	
Isabella				0.02	
Kennedy Gold Mine				0.00	
Kentfield				T.	
King City	102	29	62.2	0.00	
Laporte	73	25	49.2	0.48	
Le Grand	94	35	65.4	0.00	
Lemoncove	98	37	66.8	0.00	
Lick Observatory	78	38	56.4	0.00	
Livermore	95	34	62.4	0.00	
Lodi	88	31	58.8	0.00	
Lone Pine	85	26	54.8	0.00	
Los Gatos	90	39	62.2	T.	
Magalia	90	35	62.1	0.00	
Mammoth	105	38	70.8	0.00	
Marysville	93	32	62.0	0.00	
Merced	102	28	62.6	0.00	
Mercury				T.	
Mills College				T.	
Milo				0.00	
Milton (near)	89	44	64.4	0.00	
Mokelumne Hill	90	40	63.2	0.00	
Montague	83	20	51.6	0.13	
Monterio	78	38	57.4	0.00	
Monumental	78	29	50.0	5.16	T.
Mount St. Helena				0.15	
Napa	94	38	62.4	0.00	
Needles	96	45	69.2	0.50	
Nellie				0.27	
Nevada City	89	27	55.8	0.03	
Newcastle	92	44	66.8	0.00	
Newman	96	38	64.0	0.00	
Niles	88	36	60.0	T.	
Nordhoff	86	25	55.4	0.22	
North Bloomfield	84	29	55.8	0.15	
Oakland	81	43	59.4	0.00	
Orland	95	36	64.6	T.	
Orleans	94	32	61.8	1.22	
Oroville (near)	91	38	58.4	0.06	
Ozena				0.23	
Palermo	93	32	61.2	T.	
Peachland	93	31	59.6	T.	
Pilot Creek				0.17	
Pine Crest	93	47	65.4	0.34	
Placerville	82	26	53.4	0.00	
Point Lobos	79	53	61.7	T.	
Point Reyes Light	83	47	55.6	0.00	
Porterville	97	35	63.0	0.00	
Poway	98	39	65.3	0.17	

TABLE II.—*Climatological record of cooperative observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
California—Cont'd.	°	°	°	*Ins.*	*Ins.*
Quincy	76	17	47.0	0.14	
Redding	87	40	63.9	0.08	
Redlands	99	38	66.8	0.04	
Reedley	99	33	63.0	0.00	
Represa				0.00	
Riovista	89	36	62.8	T.	
Riverside	98	38	63.5	T.	
Rocklin	93	32	61.8	0.00	
Rohnerville				1.26	
Sacramento	82	36	58.3	0.00	
Salinas	91[b]	37[b]	60.6[b]	0.00	
Salton	95	43	70.0	0.00	
San Bernardino	101	36	64.6	0.00	
San Jacinto	98	37	63.7	0.24	
San Jose	92	37	61.2	0.00	
San Miguel Island				0.00	
Santa Barbara	91	47	64.4	0.16	
Santa Clara College	91	33	59.6	0.00	
Santa Cruz	91	34	57.8	0.00	
Santa Maria	92	39	59.8	0.15	
Santa Rosa	94	30	59.6	T.	
Sausalito				0.00	
Shasta	95	31	64.4	T.	
Sierra Madre	91	45	65.4	0.21	
Sisson	79	23	48.4	0.21	
Sonoma	90	32	59.8	T.	
Sonora	80	46	60.9	0.00	
Southeast Farallon	79	49	54.6	0.00	
Sterling				0.00	
Stockton	86	40	60.8	0.00	
Storey	96	30	61.0	0.00	
Summerdale	78	30	54.3	0.00	
Summit	68	32	50.3	0.60	
Susanville	77	20	45.6	0.17	
Tejon	88	44	64.1	0.00	
Topaz				0.00	
Towle	81[g]	30[g]	53.7[g]	0.00	
Truckee	74	26	48.8	0.00	
Tulare	98	30	61.4	0.03	
Tustin				0.15	
Ukiah	93	29	59.0	0.01	
Upland	90	40	62.4	0.02	
Upperlake	93	23	56.1	T.	
Upper Mattole				1.54	
Vacaville	95	32	62.3	0.00	
Ventura	96	50	64.0	0.23	
Visalia	95	27	63.8	0.00	
Volcano	103	45	77.8	0.00	
Wasco	100	33	61.6	T.	
West Saticoy				0.18	
Wheatland	88	35	60.1	0.00	
Woodside	85	38	59.3	0.00	
Yreka				0.38	
Zenia	79	28	54.1	0.93	
Colorado.					
Akron				1.73	16.0
Alford	83	— 4	40.9	2.13	17.0
Antelope Springs	65	3	34.0	0.75	7.5
Ashcroft	71	— 5	34.8	1.40	19.4
Blaine	86	18	51.6	0.00	
Boulder	83	16	48.6	2.54	13.0
Breckenridge	69	— 5	34.0	2.93	41.2
Buenavista	74	1	41.8	0.95	15.0
Burlington	95	10	46.7	0.76	T.
Canon City	89	11	50.2	1.22	10.0
Cardinal	70	9	35.1	4.50	53.0
Castlerock	84	2	43.4		
Cheesman	81	10	44.8	0.62	4.0
Cheyenne Wells	89	13	48.6	0.40	7.0
Clearview	72	13	40.7	0.10	1.5
Collbran	80	11	44.0	0.94	1.5
Colorado Springs	81	16	45.0	0.46	4.6
Cripplecreek				0.59	6.5
Delta	85	12	48.4	0.12	T.
Eagle	77	10	40.6	1.49	9.0
Fort Collins	85	— 8	43.6	2.60	10.5
Fort Morgan	88	0	46.4	1.62	2.0
Fowler				0.28	4.0
Frances	70	12	38.1	3.40	27.0
Fruita	80	14	46.7	0.33	
Garnett	78	5	42.3	T.	
Gleneyre	84	13	45.6	0.94	3.0
Glenwood Springs	80	10	42.6	0.69	T.
Grand Valley	80	17	46.8	0.66	T.
Greeley	87	— 8	45.6	1.47	4.0
Gunnison	78	15	43.1	0.65	1.5
Hahns Peak	69	6	37.4		
Hamps	85	9	44.7	0.23	3.5
Hoehne	90	11	48.2	0.47	T.
Holly	90	15	54.6	T.	T.
Holyoke	89	10	47.4	2.06	8.0
Idaho Springs	78	14	41.7	2.60	23.5
Lake City	72	9	40.6	0.29	4.0
Lake Moraine	68	10	36.4	1.27	16.0
Lamar	97	17	55.9	0.08	T.
Laporte				3.27	10.0
Las Animas	94	17	52.6		
Lay	78	5	37.6	0.33	3.0

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Colorado—Cont'd.	°	°	°	*Ins.*	*Ins.*
Leroy	88	9	45.2	1.93	14.0
Longs Peak	55	— 5	30.9	2.91	44.0
Mancos	76	12	46.9	0.22	
Meeker	76	9	41.1	0.46	3.0
Montrose	81	10	45.9	0.47	0.5
Moraine	72	— 5	38.5	3.45	43.5
Pagoda	82	10	41.4	0.89	3.0
Paonia	78	20	49.0	1.09	1.0
Platte Canon				1.42	7.5
Rockyford	90	16	50.2	0.10	2.0
Saguache	78	15	43.8	T.	
Salida	81	9	44.8	0.20	2.5
Santa Clara	79	10	44.4	0.43	3.0
Sapinero	71	8	39.0	0.72	5.4
Sheridan Lake	90	11	51.1	0.20	1.2
Silt	80	16	45.2	0.98	3.0
Silverton	70	7	38.3	0.34	T.
Sugar City				0.13	2.5
Trinidad	85	22	51.4	0.67	
Victor	73	10	40.0	0.57	7.4
Vilas				0.00	
Wagon Wheel	78	4	38.3	0.30	3.0
Waterdale	85	2	45.4	2.58	8.0
Westcliffe	78	8	42.0	0.98	6.0
Whitepine	67	— 3	33.7	1.13	13.5
Wray	89	11	47.5	1.64	9.5
Yuma				1.64	T.
Connecticut.					
Bridgeport	83	31	54.4	2.48	
Canton	77	19	49.2	2.68	
Colchester	78	23	52.1	2.54	
Falls Village				3.11	
Hawleyville	77	24	51.8	2.88	
Lake Konomoc				2.43	
New London	79	30	55.0	2.27	
North Grosvenor Dale	80	23	50.6	1.83	
Norwalk	79	26	51.8	2.69	
Southington	78	25	52.2	1.50	
South Manchester				2.13	
Storrs	77	23	52.1	2.57	
Voluntown	81	22	52.1	2.46	
Wallingford				2.60	
Waterbury	84	24	53.2	2.50	
West Cornwall	77	24	51.4	2.90	
West Simsbury				2.15	
Delaware.					
Milford	89	31	60.0	1.22	
Millsboro	89	32	57.8	1.49	
Newark	85	31	56.6	2.58	
Seaford	80	31	57.0	1.45	
District of Columbia.					
Distributing Reservoir[e5]	79	37	58.6	2.33	
Receiving Reservoir[e5]	80	35	56.6	2.78	
West Washington	88	32	58.0	2.43	
Florida.					
Apalachicola	87	50	71.4	1.65	
Archer	91	44	72.4	1.43	
Avon Park	93	60	76.2	3.86	
Bartow	90	50	75.0	1.82	
Bonifay	89	42	69.0	5.33	
Brooksville	94	53	75.8	0.76	
Carrabelle	87	48	70.8	3.64	
Caxambas	93	64	80.1	0.93	
Clermont	91	56	76.1	0.88	
De Funiak	89	38	67.0	6.80	
Eustis	90	49	73.6	0.91	
Federal Point	88	52	71.6	4.60	
Fernandina	88	50	72.4	10.56	
Flamingo	96	62	80.0	1.13	
Fort Meade	92	55	75.8	1.08	
Fort Myers	87	62	76.6	1.51	
Fort Pierce	90	67	78.8	5.72	
Gainesville	89	46	72.2	2.95	
Grasmere	86	54	74.0		
Huntington	89	51	73.4	1.51	
Hypoluxo	88	66	78.2	5.45	
Inverness	90	52	73.1	0.36	
Jasper	89	39	70.2	0.37	
Johnstown	90	38	70.1	1.25	
Kissimmee	89	56	74.0	3.19	
Lake City	90	43	70.4	1.42	
Macclenny	89	50	70.8	1.27	
Madison	93	43	70.8	1.76	
Malabar	90	62	77.3	7.93	
Manatee	91	56	76.0	2.86	
Marianna	91	35	68.2	4.50	
Merritt Island	87	63	76.6	4.24	
Middleburg	90	39	70.4	3.45	
Molino	96	37	68.8	6.37	
Monticello	91	44	70.4	1.87	
Mount Pleasant	89	40	68.6	5.81	
New Smyrna	91	55	76.2	1.50	
Nocatee	91	57	76.4	1.49	
Ocala	93	48	73.2	0.37	
Orange City	95	49	75.6	1.97	
Orange Home	92	50	74.2	0.48	
Orlando	90	54	74.2	3.42	
Plant City	91	52	74.6	1.96	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Florida—Cont'd.	°	°	°	*Ins.*	*Ins.*
Rockwell				1.41	
St. Andrews	88	41	69.1	7.07	
St. Augustine	90	53	73.8	6.01	
St. Leo	90	53	74.0	0.45	
Sand Key	90	71	80.0	2.00	
Stephensville[d]	89	40	70.4		
Sumner	92	42	72.2	2.57	
Switzerland	88	52	71.5	3.66	
Tallahassee	84	47	68.2	2.18	
Tarpon Springs	91	48	74.2	0.25	
Titusville	90	56	75.2	1.86	
Wausau	93	41	68.2	5.88	
Georgia.					
Abbeville				1.30	
Adairsville	83[f]	35[f]	62.0[f]	4.82	
Albany	92	37	67.7	2.96	
Allapaha	89	40	67.1	1.53	
Americus	85	43	64.6	3.17	
Athens	81	36	59.8	3.32	
Bainbridge	93	37	68.6	3.65	
Blakely	88	38	66.6	2.43	
Bowersville	90	33	62.2	2.09	
Butler				3.41	
Camak	90	32	63.0	1.75	
Canton				3.00	
Carlton				1.97	
Carrollton	83	36	61.2	2.02	
Clayton	81	31	58.0	4.57	
Columbus	88	41	66.8	2.90	
Cordele	91	37	66.4	2.87	
Covington				1.66	
Cuthbert	84	42	67.2	2.18	
Dahlonega	87	32	60.7	4.88	
Diamond	81	32	58.6	6.30	
Dublin				0.54	
Dudley	97	37	69.1	1.06	
Eastman	90	41	68.0	2.93	
Eatonton	90	38	64.8	4.03	
Elberton	88	36	63.0	1.74	
Experiment	86	39	63.4	2.07	
Fitzgerald	92	41	68.1	2.85	
Fleming	98	36	69.2	1.38	
Forsyth	88	37	64.7	2.04	
Fort Gaines	86	40	64.8	4.25	
Gainesville	87	37	59.2	2.80	
Gillsville	85	32	62.0	2.97	
Glenville	87	40	67.0	1.39	
Greenbush	81	35	60.6	5.98	
Greensboro	89	31	63.4	2.29	
Griffin	84	34	63.6	3.99	
Harrison	90	35	65.2	1.30	
Hawkinsville	93	34	67.4	2.60	
Lost Mountain	84	34	61.6	3.37	
Louisville	89	39	67.2	2.10	
Lumpkin	88	39	66.0	2.46	
Marshallville	86	40	66.4	1.66	
Mauzy	88	43	68.2	2.82	
Milledgeville	90	34	65.2	1.30	
Millen	93	30	67.0	1.57	
Montezuma				3.02	
Monticello	89	38	64.2	3.07	
Morgan	86	40	66.6	2.64	
Newnan	86	36	62.0	3.32	
Oakdale				3.18	
Oxford	82[b]	35[b]	60.6[b]	1.68	
Point Peter	89	30	62.4	1.72	
Poulan	88	39	67.2	3.08	
Putnam	90	38	65.8	2.10	
Quitman	86	40	67.6	1.98	
Ramsey	85	31	62.0	3.66	
Resaca				5.04	
Rome	84	34	61.1	5.04	
St. Marys	89	47	70.2	8.31	
Screven				2.00	
Statesboro	92	41	69.0	1.27	
Talbotton	88	35	64.2	4.13	
Tallapoosa	87	33	62.4	2.23	
Thomasville	89	40	67.7	1.94	
Toccoa	83	35	59.8	5.80	
Valdosta	86	41	68.5	2.26	
Valona	88	40	68.8	1.18	
Vidalia	91	41	67.5	1.93	
Washington	85	37	62.3	1.77	
Waverly	90	40	70.6	1.84	
Waycross	89	40	69.0	1.64	
Waynesboro	88	39	65.2	1.40	
Westpoint	84	35	62.5	3.88	
Woodbury	90	32	62.4	3.29	
Idaho.					
American Falls	82	6	43.6	0.00	
Blackfoot	81	10	42.3	0.30	3.0
Caldwell	86	16	46.2	0.33	
Cambridge	83	2	43.8	0.16	T.
Chesterfield	78	3	38.1	T.	T.
Dent				2.18	0.5
Ellerslie	85	22	47.3	0.30	
Fernwood	71	20	54.0	4.59	4.5
Forney	84	— 3	37.3	0.90	8.0

TABLE II.—*Climatological record of cooperative observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Idaho—Cont'd.	°	°	°	*Ins.*	*Ins.*
Garnet	89	19	53.2	0.12	
Glens Ferry	89	10	47.4	0.00	
Grangeville	78	13	41.5	2.87	5.5
Hailey	80	12	41.6	0.20	2.0
Hope				5.10	
Idaho Falls	79	5	41.1	0.33	4.1
Kellogg	66	11	41.4	5.95	1.5
Ketchum				T.	T.
Lake	66	4	35.8	0.80	8.0
Lakeview	60	16	41.0	4.65	
Landore	69	12	36.4	2.91	8.7
Lardo				1.95	
Lemhi Agency	78	1	37.8	0.55	5.5
Lost River	75	15	40.3	0.32	4.0
Lovell	68	16	42.6[e]	4.94	
Meadows	77	11	40.0	1.30	
Milner	87	13	43.8	0.01	0.1
Minidoka	84	10	44.4	T.	T.
Mink Creek				0.60	6.0
Moscow	74	19	43.7	2.43	3.3
Murray	62	5	35.1	5.38	2.0
Nevins Ranch				1.40	
Oakley	80	12	44.4	0.00	
Ola	78	14	44.4	0.64	T.
Orofino	76	18	43.8	1.84	T.
Paris	76	3	38.1	0.95	6.3
Payette	82	13	47.0	0.15	
Pearl				0.58	3.7
Pollock	82	22	48.8	0.66	
Poplar				0.28	0.5
Porthill	62	15	40.4	3.18	2.0
Priest River	60	12	40.4	3.78	0.5
Roosevelt	64	7	31.8	1.56	17.5
St. Maries	66[e]	15[e]	43.4[e]	5.36	0.8
Salem				0.40	4.0
Stanrod				0.23	1.8
Vernon	76	10	39.7	0.35	
Westlake				1.60	
Weston	84[b]	14[b]	40.9[b]	0.38	2.0
Illinois.					
Aledo	83	21	52.1	2.33	
Alexander	88	26	54.8	3.67	
Ashton	85	20	50.4	2.52	T.
Astoria	81	24	51.6	2.93	T.
Aurora	83	23	50.0	2.32	T.
Benton	96	32	60.4	2.01	
Bloomington	90	25	55.2	2.89	
Bushnell	89	24	54.4	3.89	
Cambridge	86	24	54.1	1.98	
Carlinville	88	26	55.2	5.14	
Carlyle				5.79	
Carrollton	89	26	55.6	4.90	
Charleston	86	28	55.4	5.53	
Chester	84	36	58.9	4.72	
Cisne	89	30	58.0	6.93	
Coatsburg	80	24	53.2	3.98	
Cobden	88	30	58.2	6.46	
Colchester	85	26	54.0	3.66	
Decatur	89	26	53.4	4.76	T.
Dixon	88[f]	20	49.6[f]	3.15	T.
Equality	90	30	58.6	7.72	T.
Flora	96	25	54.4	6.95	
Friendgrove	80	30	55.7	7.24	
Galva	85	22	51.4	2.85	T.
Grafton				8.17	
Greenville	89	29	55.9	6.17	
Griggsville	98	27	55.4	4.27	
Havana	87	27	55.2	2.91	
Henry	86	21	53.0	2.91	
Hoopeston	82	25	52.8	2.82	
Joliet	48	26	51.7	3.57	T.
Kishwaukee	88	18	51.0	3.53	T.
Knoxville	83	24	52.2	2.69	T.
Lagrange	86	24	50.7	1.65	
Laharpe	88	23	53.3	2.80	
Lanark	85	16	49.6	4.29	T.
Loami				3.51	
McLeansboro	83	31	57.2	4.01	
Martinsville	91	25	54.2	4.99	
Martinton	90	24	53.2	2.10	T.
Mascoutah	80	30	54.4	6.14	
Mattoon	84	29	58.0	4.05	T.
Minonk	86	23	52.4	2.10	T.
Monmouth	87	24	52.6	1.56	T.
Morrison	86	20	51.1	3.23	T.
Morrisonville	88	27	55.2	5.53	
Mount Carmel				7.14	
Mount Pulaski	89	27	55.0	2.80	
Mount Vernon	87	30	56.4	5.87	
New Burnside	89	27	58.5	6.44	T.
Olney	87	27	55.6	8.70	
Ottawa	87	25	53.7	1.87	T.
Palestine	86	28	55.2	8.54	
Pana	85	27	55.0	5.45	
Paris	87	25	56.2	3.73	
Peoria	86	25	53.7	3.30	
Philo	85	24	52.5	3.11	T.
Plumhill	83	30	55.2	5.67	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Illinois—Cont'd.	°	°	°	*Ins.*	*Ins.*
Pontiac	84	25	53.7	2.53	T.
Rantoul	85	25	51.8	3.34	T.
Raum	91	29	58.7	7.18	
Riley	85	21	50.7	3.89	T.
Robinson	86	27	55.6	6.95	
Rockford	85	24	52.7	3.90	T.
Rushville	86	26	54.6	3.11	
St. Charles	85	20	50.6	2.66	T.
St. John	87	28	57.4	3.60	
Shobonier	88	25	54.3	5.87	
Streator	88	22	50.1	2.64	
Sullivan	88	26	54.8	5.22	T.
Sycamore	87	20	50.2	4.61	T.
Tilden	85	32	56.3	3.91	
Tiskilwa	80	24	51.6	2.14	T.
Tuscola	85	25	52.4	4.70	
Urbana	86	27	52.3	3.11	
Walnut	86	22	53.5	3.02	
Warsaw				3.37	
Winchester	85	28	54.2	4.37	
Windsor	87	26	54.6	4.21	T.
Winnebago	86	18	50.4	4.10	T.
Yorkville	84	21	50.9	1.68	
Zion	83	16	49.4	3.73	T.
Indiana.					
Anderson	81	27	53.6	4.79	T.
Angola	78	24	51.4	4.42	0.3
Auburn	82[f]	21[f]	50.0[f]	2.59	
Bedford	83	31	55.6	7.10	T.
Bloomington	84	31	57.8	7.35	T.
Bluffton	88	20	52.0	2.75	T.
Butlerville	86	29	55.6	5.45	
Cambridge City	85	25	51.1	5.43	
Columbus	91	28	55.2	6.96	
Connersville	86	23	53.7	7.41	
Crawfordsville	87	27	53.0	2.58	
Delphi	87	24	51.2	3.83	T.
Elkhart	84	24	52.0	2.81	T.
Farmersburg	90	28	55.0	4.76	
Farmland	79	26	52.8	3.32	
Fort Wayne	84	25	52.3	2.77	T.
Franklin	86	27	54.6	5.87	T.
Greenfield	85	31	57.2	5.25	
Greensburg	87	28	54.8	5.77	T.
Hammond	84	25	50.8	2.29	
Holland	88[f]	30[f]	58.4[f]	6.79	
Huntington	80	26	50.8	2.94	T.
Jeffersonville	82	33	57.0	5.95	
Knox	83	23	52.8	2.04	T.
Kokomo	86	24	54.6	3.36	T.
Lafayette	87	28	52.6	3.60	T.
Laporte	76	23	49.6	1.27	T.
Logansport	85	24	50.9	3.94	
Madison	87	31	57.2	5.58	
Marengo	88	30	55.4	5.96	
Marion	86	25	53.0	2.59	
Markle	83	22	51.9	2.60	T.
Mauzy	86[b]	25[c]	52.9[b]	7.38	T.
Moores Hill	84	29	54.4	4.95	
Mount Vernon	89	29	57.4	8.14	T.
Northfield	82	22	50.4	4.08	T.
Paoli	87	28	57.2	5.74	
Princeton	88	31	58.2	6.47	
Rensselaer	88	22	53.4	2.36	T.
Richmond	83	25	52.6	4.61	T.
Rochester	87	24	52.1	3.99	
Rockville	85	28	53.9	4.90	
Rome	86	30	58.5	6.92	
Salem	83	30	57.0	5.74	
Scottsburg	83	30	55.8	5.92	
Seymour	82	29	55.8	7.68	
Shelbyville	86	28	54.5	6.98	T.
South Bend	85	21	52.0	1.25	
Syracuse	86	23	52.5	4.04	T.
Terre Haute	85	32	56.6	4.33	
Valparaiso	85	25	55.0		
Veedersburg			46.5		
Vevay	81	32	57.1	5.15	
Vincennes	89	29	56.4	8.92	
Washington	86	30	55.1	9.39	
Winamac	85[c]	25[c]	53.6[c]	2.72	
Indian Territory.					
Ardmore	88	31	61.9	5.15	
Calvin				3.95	
Chickasha	95[c]	25[c]	61.8[c]		
Durant	89	33	62.8	5.30	
Fairland	88[c]	29[d]	58.6[c]	8.44	
Fort Gibson				2.35	
Goodwater	96	33	64.2	9.82	
Hartshorne	72[f]	28[b]	55.0[d]	5.83	
Healdton	88	27	61.6	4.27	
Holdenville	87	32	58.5	3.50	
Marlow	88	32	61.1	1.56	
Muskogee	85	31	60.5	2.32	
Okmulgee	88	27	59.5	1.66	
Pauls Valley	87	26	59.8	3.45	
Ravia	91	34	63.4	3.77	
South McAlester	88	33	64.3	3.51	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Indian Territory—Cont'd.	°	°	°	*Ins.*	*Ins.*
Vinita	88	28	58.6	9.32	
Wagoner	85	30	59.6	1.71	
Webbers Falls	86	30	60.0	2.60	
Iowa.					
Afton	87	20	49.8	3.66	T.
Albia	85	21	49.1	4.17	T.
Algona	82	21	46.4	3.62	T.
Allerton	86	22	52.0	3.36	1.0
Alta	85	20	46.2	2.08	2.3
Alton	84	22	47.2	1.41	T.
Amana	82	21	50.1	4.52	T.
Ames	84	20	49.4	3.55	
Atlantic	85	18	48.4	4.79	0.5
Audubon	85	18	48.5	3.17	T.
Baxter	82	18	49.8	3.98	T.
Bedford	85	18	49.4	2.16	1.0
Belleplaine	80	20	40.8	4.35	
Bonaparte	86	23	53.2	2.09	
Boone	85	21	49.0	3.60	T.
Britt	85	19	46.4	3.85	2.0
Buckingham				3.57	T.
Burlington	87	25	54.3	3.03	
Carroll	84	18	48.1	3.63	T.
Cedar Rapids	87	23	50.6	4.19	
Chariton	85	20	51.4	3.46	T.
Clarinda	89	21	50.2	2.33	3.0
Clearlake	83	20	47.6	3.25	1.0
Clinton	83	20	49.8	4.45	
College Springs	82[c]	23[c]	51.3[c]	2.30	T.
Columbus Junction	84	23	51.3	3.88	T.
Corning	83	21	49.4	2.93	T.
Corydon	88	21	52.7	4.99	T.
Cresco	84	19	46.6	4.93	2.0
Creston	84	22	49.9	3.95	1.0
Cumberland				2.85	1.0
Decorah	82	16	47.2	3.40	
Delaware	80	20	48.0	3.35	
Denison	87	18	48.4	2.29	
Desoto	87	20	50.9	3.86	
Dows	86	20	47.4	3.82	0.5
Earlham	84	17	48.4	4.24	T.
Elkader	88	16	49.4	4.31	
Elliott	81	22	49.6	3.31	0.8
Estherville	88			3.06	
Fayette	83	14	47.3	2.98	T.
Florence				4.85	0.5
Forest City	92	20	46.4	3.84	T.
Fort Dodge	87	22	48.3	4.18	F
Fort Madison				1.93	
Galva	82	18	47.2	2.05	6.2
Gilman				4.35	
Glenwood	85	23	52.4	4.40	0.5
Grand Meadow	78	20	47.6	2.93	T.
Greene	85	21	48.1	3.85	T.
Greenfield	85	20	49.8	4.38	0.9
Grinnell	84	19	50.4	4.68	
Grundy Center	83	20	49.0	3.32	
Guthrie Center	82	18	49.2	3.32	T.
Hampton	91	22	49.5	3.46	T.
Hancock	85	23	50.0	4.48	T.
Hanlontown	87	19	45.9	3.60	1.0
Harlan	83	19	48.5	2.75	T.
Hopeville	87	22	51.2	3.68	T.
Humboldt	83	20	49.8	4.11	
Independence	81	19	48.4	3.98	T.
Indianola	84	20	50.8	4.13	T.
Inwood	94	16	47.3	1.47	8.0
Iowa City	86	21	50.4	5.56	
Iowa Falls	81	19	46.8	3.15	T.
Jefferson	83	19	50.1	3.18	T.
Keosauqua	85	23	51.8	2.31	
Knoxville	83	23	52.2	4.41	T.
Lacona				4.35	
Larrabee	84	22	48.6	2.61	4.0
Leclaire				3.01	
Lemars	84	22	47.2	1.78	T.
Lenox	82	22	50.0	3.32	0.8
Leon	80	22	51.2	3.91	
Little Sioux	86	21	51.0	1.54	T.
Logan	82	19	50.0	1.85	T.
Maple Valley				2.08	
Maquoketa	85	16	48.0	4.29	
Marshalltown	86	19	52.4	3.45	T.
Mason City	82	22	47.8	3.64	T.
Monticello	85	18	47.8	4.28	
Mountayr	87	20	52.0	3.75	T.
Mount Pleasant	83	22	51.8	2.04	
Mount Vernon	86	19	50.9	4.67	0.2
New Hampton	81	20	42.4	3.28	T.
Nevada				3.15	T.
Newton	82	18	49.6	5.07	T.
Northwood	84	20	46.0	4.20	7.2
Odebolt	85	20	48.2	2.49	
Ogden	85	20	49.2	3.33	
Olin	80	20	50.2	4.03	T.
Onawa	88	23	50.8	1.28	0.4
Osage	84	20	46.7	3.45	4.0
Oskaloosa	83	23	51.4	3.70	

TABLE II.—*Climatological record of cooperative observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Iowa—Cont'd.	°	°	°	*Ins.*	*Ins.*
Ottumwa	87	26	52.4	7.13	
Pacific Junction	83	20	49.2	3.61	1.6
Pella	84	22	52.4	4.40	T.
Plover	83[e]	20[e]	47.4[e]	2.86	3.0
Pocahontas	86	21	47.4	3.35	0.5
Redoak	86	25	52.5	2.73	2.0
Ridgeway	88	20	48.8	3.58	1.0
Rock Rapids	87	26	44.2	2.50	10.0
Rockwell City	83	20	49.0	3.22	
Sac City	83[1]	20[1]	44.9[1]	2.50	T.
St. Charles	90	21	52.2	3.16	1.0
Sheldon	94	20	48.2	2.41	6.0
Sibley	89	17	45.0	2.11	4.3
Sidney	83	18	49.9	2.34	1.5
Sigourney	84	21	52.0	5.23	
Sioux Center	84	18	46.1	1.20	5.0
Stockport	83	23	52.8	1.84	
Storm Lake	88	17	46.5	2.85	T.
Thurman	85	20	50.9	2.94	0.5
Tipton	85	23	52.4	4.81	0.4
Toledo	85	19	50.4	4.06	0.3
Vinton	82	20	51.2	2.22	
Washington	84	22	51.4	4.54	
Washta	92	17	48.0	1.92	T.
Waterloo	85	21	49.9	3.38	T.
Waukee	81	21	49.6	3.83	0.8
Waverly	81	20	47.6	3.04	T.
Webster City	82	17	48.4	2.42	
Westbend	83	18	46.5	2.75	0.3
Whitten	80	17	47.1	3.78	T.
Wilton Junction	83	20	51.2	3.94	
Winterset	81	29	49.0	3.74	0.8
Woodburn	80	18	49.4	3.53	T.
Zearing	85	18	48.8	3.02	T.
Kansas.					
Abilene				1.52	
Alton	93	19	52.8	0.69	2.0
Anthony				1.16	T.
Atchison	82	26	53.0	2.75	T.
Baker	85	24	52.2	1.98	2.0
Burlington	86	25	55.4	2.78	1.1
Chapman	88	28	53.3	1.25	T.
Clay Center	88	24	53.0	1.06	T.
Coffeyville	93	30	60.8		
Colby	90	8	47.0	0.98	9.6
Columbus	86	30	56.2	7.45	1.0
Cottonwood Falls	85	25	54.9	1.82	10.8
Cunningham	86	23	55.9	1.00	2.5
Dresden	92	17	51.4	0.77	4.0
Eldorado	84	25	54.8	2.12	4.0
Ellinwood	87	22	53.8	1.05	2.8
Ellsworth	90	22	53.9	2.03	T.
Emporia	83	27	55.0	1.89	6.3
Englewood	88	22	55.4	0.64	T.
Enterprise	86	26	53.8	1.61	T.
Eureka				2.82	5.5
Fall River	85	26	56.0	4.00	1.0
Farnsworth	92	13	52.0	0.77	6.1
Forsha	85	22	55.8	0.65	1.5
Fort Leavenworth	85	29	56.0	2.17	0.2
Frankfort	89	16	51.2	1.48	0.5
Garden City	92	14	54.3	0.55	1.0
Gove[*1]	91	15	50.1	0.88	4.5
Grenola	85	22	54.0	4.24	1.0
Harrison	91	18	51.0	0.45	1.0
Horton	86	27	53.0	2.63	T.
Hoxie	90	13	51.0	0.85	5.0
Hugoton	89	17	54.3	0.40	
Hutchinson	85	22	54.2	1.65	4.0
Independence	89	32	58.0	6.20	T.
Iola	84	31	55.6	2.71	10.2
Lakin	86	13	50.8	0.06	T.
La Crosse	91	20	53.1[d]	1.81	3.5
Larned	90	19	52.4	1.23	4.0
Lebo	85	29	54.0	2.01	0.8
Macksville	86	20	53.4	0.79	1.2
McPherson	87	24	56.1	1.57	1.0
Madison	89	23	54.7	2.59	5.0
Manhattan *b*	89	24	54.2	2.19	1.0
Manhattan *c*	90	24	53.4	1.80	0.8
Marion				1.65	5.0
Medicine Lodge	85	22	55.0	1.05	T.
Minneapolis	88	24	53.0	1.47	2.0
Moran	87	30	57.1	3.80	8.0
Mounthope				1.46	T.
Neosho Rapids				1.61	T.
Newton	86	23	54.8	1.30	4.0
Norton	92	11	50.6	0.56	3.0
Norwich	84	26	56.0	1.15	1.0
Oberlin				0.80	4.0
Osage City	85[e]	26[e]	54.3[e]	1.34	T.
Osborne				0.54	3.0
Oswego	87	30	57.7	7.68	T.
Ottawa	85	23	54.4	1.99	T.
Pittsburg	87	30	57.6	6.25	0.5
Pleasanton	84	30	55.2	4.20	4.0
Pratt	84	23	55.5	1.06	4.5
Republic	90	19	51.0	0.98	1.0
Rome	87	24	57.2	1.73	T.
Russell	90	21	54.1	2.39	4.0
Salina	89	22	54.0	1.41	2.0
Sedan	83	29	56.1	4.12	T.
Toronto	88	24	55.0	2.40	5.0
Ulysses	90	18	54.7[e]	0.33	T.
Valley Falls	87	27	54.0	1.81	1.0
Viroqua	87	18	53.8	0.45	T.
Wakeeney	91	13	52.4	0.83	4.0
Wakeeney (near)				0.80	3.0
Wallace	92	9	49.0	0.75	6.0
Walnut	88	31	57.5	4.93	3.0
Wamego[*1]	82	27	52.8	1.23	3.0
Winfield	84	28	56.4	1.44	T.
Yates Center	87	25	57.0	2.10	6.5
Kentucky.					
Anchorage	87	27	55.6	6.22	
Bardstown	89	28	58.9	4.33	
Beattyville	87	28	56.7	5.66	
Beaver Dam	90[e]	26	57.3	2.80	
Berea	84	27	57.5	5.47	
Blandville	83	32	58.5	4.48	
Bowling Green	89	28	58.9	3.34	
Burnside	85	32	57.8	5.29	
Cadiz	88	28[e]	59.9	3.79	
Calhoun	89	30	60.0	5.48	
Catlettsburg	84	30	57.0	4.86	
Earlington	86	29	57.2	4.11	
Edmonton	85	27	57.6	4.92	
Eubank	84	26	55.1	6.08	
Falmouth				4.59	
Farmers	82	25	55.1	4.58	
Frankfort	82	31	57.3	4.08	
Greensburg	85	28	55.0	5.33	
High Bridge	88	31	58.8	3.92	
Hopkinsville	90	29	59.6	4.43	
Irvington	85	31	58.2	5.38	
Jackson	86	30	56.6	5.57	
Leitchfield	83	28	56.6	4.16	
Loretto	88	27	59.1	4.33	
Marion	88	34	60.0	5.64	
Maysville	88	31	55.6	5.64	
Middlesboro	86	31	55.6	5.51	
Mount Sterling	81	30	54.8	5.31	
Owensboro	85	32	58.4	6.35	
Owenton	80[e]	32[e]	55.1[e]	6.07	
Paducah	85	34	59.2	4.85	
Princeton	88	33	60.9	3.90	
Richmond	84	30	57.4	4.95	
St. John	82	28	55.2	5.80	
Scott	87	30	56.3	5.05	
Shelby City	87	25	56.1	3.85	
Shelbyville	88	26	54.6	4.86	
Taylorsville	82	28	56.4	4.64	
West Liberty	86	29	56.4	4.45	
Williamsburg	86	32	58.8	4.93	
Williamstown	85	31	57.2	5.49	
Louisiana.					
Abbeville	89	44	69.0	2.10	
Alexandria	94	40	68.2	2.74	
Amite	90	39	67.0	8.60	
Baton Rouge	90	44	69.4	4.06	
Burnside	89	42	69.4	5.41	
Calhoun	90[e]	33[e]	64.6[e]	3.73	
Cameron	89	46	70.8	2.68	
Cheneyville	91	39	68.8	2.64	
Clinton	88	40	67.9	2.98	
Collinston	89	37	63.9	3.10	
Covington	89	39	66.4	10.06	
Donaldsonville	93	45	71.0	4.88	
Farmerville	87	38	67.0	4.24	
Franklin	92	44	69.6	3.89	
Georgetown	91	38	66.6	4.11	
Grand Coteau	90	43	68.6	3.29	
Hammond	87	41	67.7	6.56	
Houma	92	43	69.6	11.62	
Jennings	93	41	68.8	0.76	
Lafayette	88	43	68.3	3.17	
Lake Charles	92	44	69.0	0.08	
Lakeside	92	47	68.3	0.75	
Lawrence	90	49	71.4	6.88	
Libertyhill	89	38	64.2	4.04	
Logansport				3.22	
Mansfield	90[e]	40[e]	67.2[f]		
Melville	91	40	68.0	1.62	
Minden				4.99	
Monroe	92	39	65.8	3.96	
Morgan City				4.64	
New Iberia	87	45	70.2	2.85	
Opelousas	93	42	68.6	1.78	
Plain Dealing	90	34	66.0	2.50	
Port Eads	86	60	73.6	8.57	
Rayne	93	42	69.8	1.24	
Reserve	85	46	68.4	7.66	
Robeline	91	33	64.3	2.10	
Ruston	91	33	64.4	4.40	
Saint Francisville	92	44[e]	69.8	4.12	
Schriever	93	41	69.6		
Simmesport				2.22	
Sugar Experiment Station	86	47	69.0	7.00	
Sugartown	89	44	68.8	2.09	
Venice				8.50	
Maine.					
Bar Harbor	76	22	47.4	2.10	T.
Chesuncook	60	16	35.8	0.77	
Cornish	76	20	47.9	1.38	
Danforth				1.00	
Debsconeag	78	20	43.8	1.31	T.
Fairfield	76	18	47.4	0.38	
Farmington	78	15	46.7	1.24	
Ft. Fairfield	80	13	42.7	1.40	
Gardiner	77	16	47.2	0.78	
Grant Farm				0.48	
Greenville				0.86	
Houlton	76	17	45.6	1.00	
Lewiston	78	23	49.0	1.01	
Madison	72	22	46.6	1.13	
Mayfield	73	18	44.5	0.96	T.
Millinocket	79	15	44.0	1.49	
North Bridgton	77	22	49.8	1.56	
Oquossoc	71	15	45.4	1.67	
Orono	78	15	46.7	0.78	T.
Patten	77	12	44.6	1.38	
Rumford Falls	79	18	47.1	1.51	T.
The Forks				1.24	
Thomaston	75	18	45.8	1.45	
Vanburen	80	10	42.0	1.14	T.
Winslow	75	15	46.7	0.62	
Maryland.					
Annapolis	89	33	60.5	2.60	
Bachmans Valley				5.75	
Boettcherville	93	24	56.2	4.55	
Cambridge	89	34	60.0	1.30	
Cheltenham	86	29	56.9	1.47	
Chestertown	80	34	56.9	1.78	
Chewsville	86	26	54.6	3.96	
Clearspring	80	31	53.4	3.59	
Coleman	93[k]	35[k]	58.8[k]	1.88	
Collegepark	90	27	57.2	2.01	
Colora				3.29	
Cumberland				3.52	
Darlington	84[f]	31[f]	55.1[f]	3.08	
Deerpark	81[f]	20[f]	49.2[f]	3.38	2.0
Denton	86	28	57.8	1.50	
Easton	84	31	57.4	1.37	
Fallston	86	31	56.1	3.53	
Frederick	90	29	56.8	3.91	
Grantsville	81	26	50.9	4.16	0.5
Greatfalls	88	27	56.5	2.71	
Greenspring Furnace	85	25	53.6	3.67	
Harney				3.94	
Jewell	85	33	58.8	1.61	
Keedysville	90	28	56.9	3.80	
Laurel	89	32	58.0	2.36	
McDonogh	86	30	55.4	4.01	
Mount St. Marys College	87	32	56.8	4.21	
New Market	84	29	56.0	3.46	
Oakland	79	21	49.4	4.91	0.2
Pocomoke City	85	34	59.5	1.25	
Porto Bello	87	37	60.0	1.10	
Princess Anne	87	28	57.6	1.37	
Solomons	86	39	60.7	1.23	
Sudlersville	89	34	58.0	1.83	
Takoma Park	86	30	56.1	2.65	
Van Bibber	82	32	56.0	2.48	
Westernport	87	25	53.8	4.01	
Woodstock	82	30	53.8	3.81	
Massachusetts.					
Amherst	80	22	50.0	2.27	
Bedford	75	23	50.6	1.42	
Bluehill (summit)	78	27	51.4	1.66	
Cambridge	79	26	51.4	1.23	
Chestnuthill	80	25	52.5	1.53	
East Templeton[*1]	71	25	49.3	1.26	
Fallriver	76	29	53.5	1.98	
Fitchburg	78	24	51.3	1.94	
Framingham	79	20	50.4	1.41	
Groton	76	19	49.2	1.62	
Hyannis				1.87	
Jefferson				1.93	
Lawrence	79	24	50.8	1.01	
Leominster				1.96	
Lowell	77	24	52.8	1.33	
Ludlow Center				1.48	
Middleboro	80	24	50.6	1.80	
Monson	76	20	49.2	1.99	
New Bedford	77	32	53.5	1.96	
Plymouth[*1]	75	34	51.6	1.79	
Princeton				1.80	
Provincetown	80	37	55.0	1.50	
Salem				1.32	
Somerset[*1]	79	24	52.6	2.17	
Sterling				1.63	
Taunton	79	20	49.6	1.83	
Webster				1.91	
Westboro	80	20	52.8	1.52	

TABLE II.—*Climatological record of cooperative observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Massachusetts—Cont'd.	°	°	°	*Ins.*	*Ins.*
Weston	77	22	49.2	1.30	
Winchendon	.....	.....	.....	1.63	
Worcester	77	28	52.2	1.47	
Michigan.					
Adrian	83[e]	22[e]	52.8[e]	1.90	
Agricultural College	83	20	50.9	1.75	T.
Allegan	91	20	52.8[d]	2.12	0.2
Alma	85	18	49.4	3.38	T.
Ann Arbor	85	20	50.6	3.45	
Arbela	83	19	50.9	2.64	T.
Baldwin	83	13	47.8	2.65	
Ball Mountain	82	21	49.8	3.31	
Battle Creek	84	19	52.0	1.69	T.
Bay City	78	30	51.0	1.25	
Benzonia	81[f]	23[f]	49.3[f]	4.29	1.0
Berlin	83	18	49.9	3.55	
Big Rapids	82	16	47.3	3.64	T.
Birmingham	82	22	50.6	.....	
Bloomingdale	83	21	51.6	2.62	T.
Calumet	76	18	43.2	3.89	6.2
Cassopolis	83	22	51.5	1.50	
Charlevoix	83	29	50.4[e]	2.10	
Charlotte	.....	.....	.....	0.98	
Chatham	82	5	42.8	2.75	2.0
Cheboygan	85	24	.....	0.50	T.
Clinton	85	19	50.4	2.87	
Coldwater	83	20	52.6	3.70	0.2
Concord	81	20	50.8	2.41	
Deer Park	80	16	44.8	1.58	2.3
Detour	72	25	46.4	4.71	1.5
Dundee	84	20	51.9	1.65	
Eagle Harbor	78	22	44.9	3.62	.....
East Tawas	83	18	48.3	2.90	
Eloise	84	20	51.0	1.49	
Fennville	84	22	51.0	4.48	
Fitchburg	87	18	49.2	3.36	0.5
Flint	83	17	49.9	2.40	
Gaylord	86	.....	.....	.....	5.0
Gladwin[e]	85	18	47.3	.....	T.
Grand Haven	78	22	50.2	3.97	T.
Grand Marais	74	20	44.6	3.95	T.
Grape	83	20	50.6	1.66	
Grayling	83	16	47.0	2.15	5.0
Hagar	83	19	49.1	1.87	T.
Harbor Beach	80	24	51.9	2.64	T.
Harrisville	87	20	49.0	2.30	
Hastings	85	16	50.6	1.41	T.
Hayes	86	24	51.8	2.29	
Highland	.....	.....	.....	3.96	
Holland	77	20	48.2	5.77	
Howell	81	17	49.5	3.24	
Humboldt	76	−3	39.4	3.15	6.5
Iron Mountain	83	9	43.8	1.75	4.0
Iron River	79	4	40.4	3.00	4.0
Ironwood	75	10	42.6	2.14	1.5
Ivan	83	17	47.4	3.76	1.0
Jackson	86	21	51.7	2.65	
Jeddo	82	24	51.2	3.39	
Lake City	.....	.....	.....	2.40	T.
Lansing	83	19	50.9	1.45	T.
Ludington	79	23	51.0	2.60	
Mackinac Island	80	27	48.8	4.31	3.6
Mackinaw City	84	25	46.8	5.14	T.
Mancelona	82	12	44.8	0.98	1.0
Marine City	79	21	49.1	1.81	
Menominee	86	18	47.8	2.32	T.
Montague	81	19	49.7	3.47	
Mount Pleasant	.....	.....	.....	2.85	T.
Muskegon	83	19	51.0	4.23	T.
Old Mission	84	29	48.8	2.52	
Olivet	78	21	49.6	1.77	T
Omer	83	14	.....	3.38	T.
Onaway	77	20	45.4	.....	
Ovid	82	18	50.5	1.87	
Owosso	82	17	51.3	2.50	T.
Petoskey	85	21	49.6	5.76	T.
Plymouth	85	19	50.0	2.35	
Pontiac	83	20	50.6	1.07	T.
Powers	84	10	46.4	.....	6.0
Reed City	83	18	48.7	4.12	T.
Saginaw (W. S.)	85	22	50.6	3.10	T.
St. James	80	29[e]	52.6[d]	3.21	0.2
St. Johns	84	17	50.9	1.65	T.
St. Joseph	78	24	52.5	1.75	
Slocum	79	16	49.2	4.18	T.
Somerset	81[d]	18[e]	50.6[d]	3.42	
South Haven	85	19	49.9	3.13	T.
Stanton	84[e]	18[e]	47.1[e]	5.12	T.
Thomaston	82	4	39.9	4.01	6.0
Thornville	80	20	50.6	3.52	
Traverse City	80	27	48.2	3.10	1.0
Vassar	84	15	50.4	2.32	
Wasepi	81	18	50.6	3.52	1.0
Webberville	84	17	50.3	2.32	T.
Wetmore	82	2	39.7	1.73	12.5
Whitefish Point	79	22	45.4	4.59	0.4
Ypsilanti	80	19	49.0	2.28	
Minnesota.					
Albert Lea	85	21	47.0	4.05	2.0
Alexandria	83	16	42.1	2.71	3.0
Amboy	89	19	46.8	3.03	1.1
Angus	82	11	40.0	0.27	
Ashby	80	12	42.6	1.66	2.0
Beardsley	85	9	42.3	2.05	4.0
Beaulieu	81	9	41.2	1.85	T.
Bemidji	84	7	41.6	1.99	1.0
Bird Island	80	12	44.2	3.09	6.0
Brainerd	79	9	42.0	2.87	1.5
Caledonia	82	17	45.7	3.08	1.0
Collegeville	78	14	44.2	2.34	2.7
Crookston	80	14	40.4	1.18	0.5
Detroit	81	8	39.5	2.48	1.0
Faribault	90	15	48.6	2.07	4.1
Farmington	78	8	44.5	3.03	6.0
Fergus Falls	82	16	44.4	1.93	1.0
Floodwood	79	6	41.3	2.40	T.
Glencoe	83	10	41.5	3.15	4.0
Grand Meadow	84	17	45.6	3.50	3.5
Hallock	78	4	38.5	0.20	T.
Halstad	82	10	40.9	0.77	T.
Hinckley	81	11	42.4	2.76	3.0
Hovland	79	12	41.4	2.22	T.
Lake Winnibigoshish	76	12	40.6	2.81	T.
Leech	80	7	40.5	3.07	T.
Long Prairie	90	7	42.7	2.37	2.0
Luverne	82	16	44.8	1.95	8.0
Lynd	81	10	43.0	1.86	10.0
Mankato	.....	.....	.....	3.14	2.0
Maplеplain	82	14	44.6	3.21	5.3
Milan	83	11	43.2	2.18	7.0
Montevideo	82	14	44.7	2.17	5.0
Mora	81	9	42.4	3.55	1.8
Morris	82	6	42.3	1.19	4.6
Mount Iron	75	4	39.4	2.55	T.
New London	85	10	43.2	2.29	3.0
New Richland	89	19	47.2	2.35	1.7
New Ulm	84	10	45.8	3.14	2.0
Park Rapids	79	7	40.5	2.37	2.3
Peterson	.....	.....	.....	3.41	
Pine River	78	6	42.0	3.06	1.5
Pipestone	81	15	43.1	1.24	4.0
Pokegama Falls	81	5	41.0	2.73	0.4
Pratt	85	16	45.2	3.89	4.0
Redwing	.....	.....	.....	3.08	2.0
Reeds	.....	.....	.....	3.16	2.0
Rolling Green	84	23	46.4	3.40	T.
St. Charles	86	22	48.0	3.09	0.5
St. Cloud	82	11	43.9	3.13	1.8
St. Peter	87	13	47.4	3.47	4.5
Shakopee	80	14	45.2	2.76	5.0
Stillwater	.....	.....	.....	2.42	3.8
Thief River Falls	81	8	40.5	0.86	5.5
Tonka	.....	.....	.....	3.00	.....
Wabasha	89	14	48.4	3.88	3.0
Wadena	78	9	41.6	1.39	1.1
Willow River	80	6	40.8	3.53	2.1
Winnebago	90	20	47.3	3.39	T.
Winona	81	18	46.8	2.17	T.
Zumbrota	.....	.....	.....	2.57	.....
Mississippi.					
Aberdeen	88	35	61.4	5.18	
Austin	89	33	61.8	5.99	
Batesville	87	32	62.4	1.95	
Bay St. Louis	88	44	69.2	7.64	
Biloxi	90	46	70.5	6.01	
Booneville	88	35	62.4	4.05	
Brookhaven	91	32	66.5	3.35	
Canton	90	35	65.4	5.44	
Columbia	.....	.....	.....	4.64	
Columbus	88	36	62.4	5.92	
Corinth	81	34	60.2	3.56	
Crystal Springs	94	38	65.6	7.26	
Duck Hill	91	32	64.6	2.31	
Edwards	89	34	65.0	4.89	
Enterprise	.....	.....	.....	3.90	
Fayette	85	39	65.4	2.59	
Fayette (near)	.....	.....	.....	1.36	
Greenville *a*	85	36	64.5	2.37	
Greenville *b*	88	36	64.6	2.41	
Greenwood	88	34	63.4	4.50	
Hazlehurst	90	40	65.8	7.50	
Hernando	89	35	62.4	6.80	
Holly Springs	83	36	61.6	5.15	
Indianola	86	32	63.0	2.43	
Jackson	86	36	63.8	9.58	
Kosciusko	90	35	63.5	5.97	
Lake	91	33	63.4	3.95	
Lake Como	92	38	66.2	3.41	
Leland	.....	.....	.....	3.01	
Louisville	89	37	64.2	4.02	
McNeill	86	39	66.4	8.03	
Macon	90	36	64.9	3.41	
Magee	90	34	65.0	4.12	
Magnolia	.....	.....	.....	3.66	
Merrill	.....	.....	.....	4.62	
Natchez	91	42	69.8	2.53	
Mississippi—Cont'd.					
Nitta Yuma	89	33	63.2	2.94	
Patmos	.....	.....	.....	5.10	
Pearlington	88	41	68.4	8.30	
Pecan	92	40	70.1	5.85	
Pittsboro	88	33	63.0	3.79	
Pontotoc	81	34	61.8	4.91	
Port Gibson	89	34	64.9	4.30	
Porterville	90	33	64.0	3.46	
Quitman	91	32	66.2	2.68	
Ripley	83	31	59.0	8.40	
Shelby	90	30	65.2	1.91	
Shoccoe	90	35	65.7	6.45	
Shubuta	.....	.....	.....	2.34	
Stonington	.....	.....	.....	4.59	
Suffolk	90	37	67.2	2.86	
Swan Lake	88	32	64.1	2.33	
Tchula	89	33	65.0	2.70	
Tupelo	88	32	62.5	3.96	
University	88	33	64.2	3.30	
Utica	84	37	64.2	4.05	
Walnutgrove	87[e]	36[e]	65.1[e]	6.40	
Walthall	.....	.....	.....	2.30	
Watervalley	88	33	63.0	4.90	
Wayneshoro	84	35	64.4	4.45	
Woodville	86	41	66.6	4.35	
Yazoo City	88	35	64.4	4.40	
Missouri.					
Albany	.....	.....	.....	1.67	
Appleton City	86	28	55.8	6.18	2.0
Arthur	86	26	55.8	5.83	6.0
Avalon	88	24	54.4	3.09	0.5
Bethany	80	22	50.8	2.51	1.0
Birchtree	83[d]	36[d]	56.2[d]	4.74	T.
Blue Springs	81[d]	27[d]	52.2[d]	3.89	T.
Bolivar	84	29	57.6	8.19	T.
Boonville	.....	.....	.....	4.17	
Brunswick	83	29	53.2	4.23	T.
Caruthersville	90	30	60.6	4.02	
Conception	83	23	52.6	2.00	T.
Darksville	88[d]	26	55.6[b]	3.31	T.
Dean	84	25	57.6	3.73	
De Soto	85	29	56.4	4.53	T.
Doniphan	82[e]	31	57.2	3.85	
Downing	.....	.....	.....	3.03	T.
Eldorado Springs	85	25	56.8	6.42	3.2
Fairport	.....	.....	.....	2.52	1.0
Fayette	86	29	53.0	3.45	T.
Fulton	89	28	55.2	8.36	T.
Gallatin *1	84	26	55.8	1.24	1.0
Gano	85	30	56.9	5.07	T.
Glasgow	.....	.....	.....	4.00	
Goodland	83	27	54.3	4.70	0.1
Gorin	.....	.....	.....	2.79	
Grant City	85	23	52.6	4.35	
Harrisonville	84	27	53.8	2.79	
Hazlehurst	.....	.....	.....	1.67	T.
Hermann	.....	.....	.....	10.51	
Houston	83	28	55.2	3.70	
Huntsville	86[f]	33[f]	54.8[f]	2.77	
Ironton	85	26	55.2	5.03	
Jackson	89	28	58.2	5.83	
Jefferson City	85	29	54.4	9.24	
Kidder	85	25	53.2	1.83	1.8
Koshkonong	84	34	57.6	4.24	
Lamar	86	32	57.0	7.17	T.
Lamonte	.....	.....	.....	6.25	T.
Lebanon	80	30	54.6	9.23	0.5
Lexington	86	29	54.8	3.23	T.
Liberty	82	28	54.1	2.40	T.
Lockwood	82	28	55.8	9.16	T.
Louisiana	85	27	53.6	4.55	
Macon	87	26	55.3	2.79	T.
Marblehill	87	29	58.4	4.35	
Marshall	86	28	54.4	3.87	
Maryville	83	23	50.4	2.97	0.8
Mexico	88	28	54.5	4.73	0.7
Monroe	86	25	53.7	2.72	T.
Montreal	86	29	55.6	6.69	T.
Mount Vernon	85	25	54.7	4.89	T.
Neosho	84	25	57.0	7.95	
New Haven	.....	.....	.....	10.78	T.
New Madrid	.....	.....	.....	3.92	
New Palestine	87	31	56.4	6.42	
Oakfield	85	30	56.2	6.91	0.7
Olden	87	28	56.5	4.61	
Oregon	80	25	51.9	1.73	T.
Osceola	.....	.....	.....	4.61	
Pine Hill	.....	.....	.....	5.57	T.
Princeton	82	24	54.0	2.29	T.
Protem	84	29	57.9	2.19	
Rockport	.....	.....	.....	1.87	1.0
Rolla	.....	.....	.....	5.45	T.
St. Charles	87	30	56.4	9.69	
St. Joseph	.....	.....	.....	1.81	T.
Sarcoxie	.....	.....	.....	6.22	
Sedalia	82	30	54.8	5.52	T.
Seymour	83	28	54.6	3.35	T.
Sikeston	87	28	58.7	3.47	

TABLE II.—*Climatological record of cooperative observers*—Continued.

Stations.	Temperature. (Fahrenheit.)			Precipitation.	
	Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.
***Missouri*—Cont'd.**	°	°	°	*Ins.*	*Ins.*
Steffenville	83	24	54.6	3.60	
Subiett	82	25	55.4	3.27	T.
Trenton	79	26	53.3	1.78	T.
Unionville	87	20	51.8	3.85	T.
Versailles	86	28	56.0	10.81	
Warrensburg	88	30	56.2	3.58	T.
Warrenton	85	29	53.2	8.74	T.
Warsaw	85	27	54.8	5.84	
Wheatland				4.77	1.5
Willowsprings	83	26	54.6	4.33	
Windsor	88	30	55.1	5.24	
Montana.					
Absarokee				1.83	0.7
Adel	75	— 1	37.8	1.37	12.5
Anaconda	74	3	35.8	0.56	
Augusta	78	— 2	40.6	0.47	5.0
Billings	90	1	46.2	1.41	4.5
Boulder	77	4	37.0	T.	T.
Bozeman	78	8	38.6	1.18	6.6
Butte	71	5	37.0	0.65	
Canyon Ferry	84	8	39.6	0.30	3.0
Cascade	85	3	45.0	0.38	4.0
Chinook[1]	89	— 8	39.8		
Choteau	78	— 4	40.6	0.10	
Clearcreek	86	1	41.0	1.16	5.0
Columbia Falls	60	9	38.0	2.54	0.5
Copper				0.75	7.5
Crow Agency	83	— 3	43.8	2.20	5.0
Dayton	69	16	40.9	1.17	1.8
Decker	86	5	43.2	1.11	2.0
Deerlodge				0.29	1.1
Dillon	76	2	40.2	0.39	1.0
Ekalaka	83	3	41.9	0.95	
Fallon	86	2	42.2		
Forsyth	89	— 2	44.6	1.11	2.0
Fort Benton	82	— 2	40.8	0.61	2.0
Fort Harrison	80	5	38.6		
Fort Logan	74	— 2	33.0	0.08	0.8
Glasgow	79	— 8	39.6	0.10	1.0
Glendive	84	11	43.6	0.10	0.2
Gold Butte				1.06	11.0
Graham	87	— 5	41.8	1.09	4.5
Grayling				0.74	4.5
Greatfalls	77	2	41.0	0.26	
Homepark				0.80	7.0
Lakeview				0.20	2.0
Lame Deer	90	10	47.3	1.65	5.0
Lewistown	92	— 4	41.2	0.75	8.0
Livingston	89	9	42.4	1.67	11.0
Lodge Grass	84	8	41.3	1.61	2.5
Malta	86	— 6	41.4	0.40	4.0
Marysville	74	1	36.4	1.49	10.0
Missoula	80[a]	10	39.3[a]	1.26	1.0
Millets Ranch				0.42	4.2
Musselshell				1.40	7.3
Nye				2.10	17.0
Ovando	78	— 7	35.4	1.27	6.0
Philipsburg	74	0	37.5	0.74	1.5
Plains	68	15	41.7	1.65	
Poplar	83	9	42.4	T.	T.
Raymond				0.37	3.5
Redlodge	78	— 6	36.0	2.97	30.9
Ridgelawn	80	10	41.5	0.00	
St. Peter	77	— 6	38.5	1.21	17.0
Springbrook	81	4	41.6	1.28	10.0
Steele	86	— 4	43.3	0.50	7.0
Toston	71	1	35.2	T.	T.
Townsend				0.11	1.0
Troy	62	11	42.0	4.28	T.
Utica	79	2	40.0	0.39	4.5
Virginia City	72	3	37.1	1.31	8.8
Warrick				1.31	7.6
Whitlash				0.42	
Wolf Creek	80	6	40.6	0.55	4.0
Wolf Point				1.70	4.0
Wolsey	74	—13	31.6	0.64	13.5
Yale	80	— 5	38.6	1.12	9.0
Nebraska.					
Agate	83	6	40.4	1.25	8.2
Agee[1]	88	22	44.8	2.21	
Albion	87	18	47.2	0.57	T.
Alma	93	17	51.0	0.44	3.0
Arapaho				0.90	6.0
Arcadia				1.04	
Ashland	88	24	51.5	1.75	1.2
Ashton				0.62	
Auburn	87	21	52.0	2.12	1.5
Aurora	93	21	50.4	0.91	0.1
Beatrice	84	23	51.0	2.30	2.0
Beaver	90	19	50.5	0.79	4.0
Bellevue	88	23	51.9	4.03	1.0
Blair	83	22	49.6	2.39	T.
Bluehill				0.30	3.0
Bradshaw				2.79	0.8
Bridgeport	91	11	43.4	0.43	1.0
Broken Bow	92	17	47.6	1.13	
Burchard				2.12	1.0
Burge				1.47	3.0
Burwell				0.65	T.
Callaway	91	17	50.0	0.66	T.
Central City				0.78	
Chester				0.70	1.2
Clearwater	95	18	49.0	1.30	T.
Cody				0.77	1.0
Columbus	92	22	48.5	1.14	0.5
Crete	89	20	51.4	1.84	1.0
Culbertson	88	14	47.5	1.80	6.0
Curtis	85	18	46.8	1.48	5.0
David City	84	23	49.0	1.44	0.5
Dawson	87	21	51.8	2.00	T.
Dubois				2.07	
Duff				1.58	T.
Edgar				0.73	2.0
Ericson				0.60	1.0
Ewing				2.14	1.0
Fairbury	90	18	50.2	1.70	2.8
Fairmont	90	20	48.2	1.37	2.0
Fort Robinson	88	8	42.0	1.15	2.8
Franklin	91	11	50.0	0.59	
Fremont	90	23	50.4	2.59	
Fullerton				0.55	0.5
Geneva	92	19	50.6	0.99	1.5
Genoa (near)	88	20	49.6	0.38	T.
Gering	90	15	46.9	1.22	
Gordon				1.05	3.0
Gosper				0.82	3.0
Gothenburg	93	16	49.9	0.91	1.0
Grand Island	91	22	49.7	1.21	0.5
Grant	88	12	46.9	0.96	2.0
Greeley				0.10	T.
Guide Rock				0.45	2.0
Halsey	95	21	47.4	1.12	
Hartington	88	29	45.7		
Harvard	87	18	47.8	1.07	0.8
Hastings[1]	91	24	51.3	0.60	1.0
Hayes Center	91	12	50.8	2.75	9.0
Hay Springs	90	7	44.1	0.92	6.0
Hebron	91	20	51.1	1.35	2.0
Hendley				0.58	4.0
Hickman				2.13	1.0
Holbrook				0.83	2.0
Holdrege	83	17	49.1	0.10	1.0
Hooper[1]	84	26	48.5	1.55	0.2
Imperial	89	11	46.1	1.58	6.0
Johnstown				1.52	0.2
Kearney	91	20	50.1	0.76	2.0
Kennedy	90	11	45.6	0.80	
Kimball	83	4	43.0	0.73	5.5
Kirkwood	95[e]	13[d]	48.3[e]	2.01	
Leavitt	92	20	49.9	1.57	T.
Level				0.95	
Lexington	91	17	46.8	1.14	2.0
Loup	88	17	49.0	0.73	
Lynch	96	18	48.4	2.09	
McCook				1.20	5.0
McCool				1.65	
Madison	86[f]	23[f]	44.4[f]	0.59	T
Marquette				1.10	T.
Mason				1.18	
Minden	91	17	49.3	0.57	2.8
Monroe				1.03	0.8
Nebraska City	87	22	52.0	2.21	3.0
Nemaha				1.60	T.
Norfolk	90	19	47.7	0.82	0.2
North Loup	92	19	48.8	0.42	T.
Oakdale	85	19	46.8	1.41	0.5
Oakland	87	21	49.2	0.92	0.2
Odell				1.21	0.2
Ord				0.80	
Osceola				0.85	T.
Palmer				0.20	
Palmyra[1]	88	24	51.5	2.00	1.5
Pawnee City	87	22	51.6	2.16	0.5
Plattsmouth				2.96	1.0
Plymouth	89	22	52.6	1.20	
Purdum	94	14	46.7	1.10	
Ravenna	90	19	48.8	1.10	0.5
Redcloud	88[c]	20[b]	49.7[c]	0.12	1.2
Republican				0.45	3.0
Rulo				2.46	
St. Libory				0.86	T.
St. Paul	92	20	49.7	0.96	T.
Santee	93	24	49.4	1.83	
Schuyler				1.09	0.2
Seward	90	24	50.1	4.15	2.0
Smithfield				0.35	
Springview	92	15	47.6	1.81	2.0
Stanton	91	16	50.4	0.80	1.0
Strang				0.83	2.0
Stratton				1.45	5.0
Stromsburg				1.00	
Superior	87	19	47.6	0.30	1.0
Syracuse				2.30	1.0
Tablerock				2.29	2.0
Tecumseh	86	25	49.8	1.65	0.5
Tekamah	90	20	49.9	1.51	T.
Turlington	87	22	50.8	1.78	3.0
University Farm	95	23	51.8	2.69	2.0
Wahoo				3.04	T.
Wakefield	84	21	48.2	1.17	0.3
Wauneta				1.54	6.0
Weeping Water				2.45	1.5
Westpoint	89	21	49.9	1.10	
Wilber				1.55	2.0
Winnebago	87[b]	16	49.4[d]	1.12	
Wisner				0.82	
Wymore				2.20	T.
York	91	21	49.4	3.02	1.0
Nevada.					
Amos	83	1	42.4	0.02	
Battle Mountain	96	8	53.0	0.05	0.5
Beowawe[1]	81	12	44.2	0.00	
Carlin[1]	82	10	39.7	0.20	2.0
Carson City	82	15	47.1	0.00	
Dyer	80	14	46.8	0.00	
Elko[1]	82	20	40.4	0.00	
Eureka	80	28	52.8	T.	T.
Fencion				0.30	3.0
Geyser	78	4	41.3	0.00	
Golconda[1]	77	30	46.6	0.00	
Hazen	89	14	50.8	0.00	
Humboldt	87	12	49.0	0.00	
Lewers Ranch	81	22	50.2	0.00	
Lovelocks	85	10	47.4	0.00	
Martins	89	16	50.0	0.00	
Mill City[1]	72	32	49.0	0.00	
Morey	75	12	45.0	0.00	
Palisade				0.00	
Palmetto	75	12	44.6	T.	T.
Potts	74	6	39.0	0.00	
Reno State University	81	21	48.6	T.	
San Jacinto	77	0	37.0	0.21	3.0
Tecoma	78	2	40.0	0.40	4.0
Verdi	77	18	45.2	0.00	
Wabuska	80	11	45.4	0.00	
Wadsworth	91	21	53.7	0.00	
Wells				0.00	
Wood	79	8	42.8	0.39	5.0
New Hampshire.					
Alstead	72	22	47.8	1.27	
Bartlett				2.20	
Derlin Mills	73	25	46.6	1.34	
Bethlehem	75	17	44.6	1.29	T.
Bretton Woods				1.76	
Brookline[1]	76	19	48.3	1.62	
Durham	76	21	48.8	1.20	
Franklin Falls	78	17	47.8	1.47	
Grafton	78	14	46.0	1.50	
Hanover	77	15	47.2	1.02	T.
Keene	78	16	48.2	1.12	T.
Littleton	74	18	45.2	1.09	T.
Nashua	80	21	50.2	1.05	
Newton	79	17	48.1	1.15	
North Woodstock				1.04	
Plymouth	75	16	46.5	2.17	
Stratford	81	15	46.4	0.57	
New Jersey.					
Asbury Park	83	36	57.6	2.45	
Bayonne	86	31	55.8	2.49	
Belvidere	87	26	52.7[e]	4.15	
Bergen Point	82	32	55.4	2.70	
Beverly	87	29	55.9	3.84	
Bridgeton	89	30	59.0	1.61	
Browns Mills	84	25	54.0	3.21	
Canton				1.56	
Cape May C. H.	84	32	58.1	1.39	
Charlotteburg	83	19	50.8	4.31	
Clayton	87	31	57.0	1.78	
College Farm	85	27	54.8	2.99	
Dover	81	25	51.0	3.35	
Englewood	78	31	53.8	3.11	
Flemington	86	29	55.6	3.21	
Friesburg	87	29	56.7	2.60	
Hightstown	80	28	53.6	2.73	
Imlaystown	81	32	56.5	3.79	
Indian Mills	90	28	56.8	2.43	
Lakewood	81	29	55.8	2.20	
Lambertville	86	28	55.4	3.61	
Layton	87	17	57.6	3.35	
Moorestown	87	29	56.3	3.84	
Newark	83	30	55.4	2.91	
New Brunswick	85	30	56.7	3.01	
Newton	89	22	52.0	4.83	
Oceanic	80	34	56.8	2.31	
Paterson	86	31	56.4	3.10	
Phillipsburg	88	29	54.6	4.09	
Plainfield	84	29	53.6	2.64	
Pleasantville				0.89	
Rancocas				4.43	
Sandy Hook	82	37	57.2	2.53	T.
Somerville	85	26	54.5	3.24	
South Orange	78	32	53.2	3.07	
Sussex	85	26	54.0	2.43	
Toms River	87	25	56.0	2.22	

TABLE II.—*Climatological record of cooperative observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
New Jersey—Cont'd.	°	°	°	*Ins.*	*Ins.*
Trenton	82	33	57.6	2.54	
Vineland	89	28	56.7	1.24	
Woodbine	85	31	57.4	0.75	
Woodstown	.....	.....	.....	1.39	
New Mexico.					
Alamagordo	86	33	59.2	0.34	
Albert	87	25	55.9	0.45	
Albuquerque	84	27	55.6	0.00	
Alma	88[1]	23[1]	57.8[1]	0.45	
Alto	.....	.....	.....	0.73	
Artesia	83	31	57.8	0.89	
Bellranch	88	24	56.0	0.06	
Bloomfield	84	14	51.4	0.00	
Brice	87	36	62.1	0.97	
Cambray	.....	.....	.....	T.	
Carlsbad	88	32	61.2	1.01	
Chama	.....	.....	.....	0.20	T.
Cimarron	81	19	49.5	0.28	T.
Cliff	90[c]	25[c]	59.6[c]	0.20	
Cloudcroft	64	22	43.0	0.99	
Datil	79	19	49.6	T.	T.
Deming	87	31	59.4	0.32	
Dorsey	80	16	48.8	0.23	T.
Eagle Rock Ranch	77	18	47.4	0.27	
Elizabethtown	69	8	40.0	0.55	
Elk	79	31	53.6	0.46	
Espanola	88	26	54.8	0.26	
Fort Bayard	82	32	56.9	0.35	
Fort Stanton	80	22	51.4	.....	
Fort Union	85	11	48.8	1.54	1.0
Fort Wingate	76	23	50.0	0.30	T.
Fruitland	81	19	50.1	T.	
Gage	.....	.....	.....	0.44	
Garcia	.....	.....	.....	T.	T.
Gran Quivira	.....	.....	.....	0.16	
Hillsboro	84	33	58.9	0.25	
Hope	.....	.....	.....	0.80	
Laguna	83	25	52.1	0.50	
Lagunita	84	20	53.0	0.20	
Lake Valley	.....	.....	.....	0.28	
Las Vegas	81	21	50.0	0.48	T.
Lordsburg	91	32	63.1	0.32	
Los Alamos	.....	.....	.....	0.91	
Los Lunas	78	32	56.0	1.15	
Luna	77	20	47.4	0.62	
Magdalena	.....	.....	.....	0.07	
Manuelito	.....	.....	.....	0.11	
Mesilla Park	89	30	60.5	0.83	
Mimbres	.....	.....	.....	0.30	
Mineral Hill	.....	.....	.....	0.32	
Mountainair	80	22	48.6	0.31	
Nara Visa	85	26	55.4	0.22	T.
Patterson	.....	.....	.....	0.40	
Portales	86	24	56.3	0.24	
Raton	80	22	49.8	0.35	1.0
Redrock	.....	.....	.....	0.13	
Rincon	89	28	61.4	0.15	
Rociada	74	6	43.6	0.59	T.
Rosa	.....	.....	.....	0.32	
Rosedale	.....	.....	.....	0.20	
Roy	75[b]	23[b]	52.5[b]	0.11	
San Marcial	91	28	59.9	T.	
San Rafael	90[b]	29	52.2[d]	0.80	
Socorro	81	28	55.0	0.25	
Springer	83	17	49.8	0.01	
Strauss	.....	.....	.....	1.00	
Taos	84	22	50.0	1.35	4.0
Trampas	.....	.....	.....	1.45	6.0
Tres Piedras	78	11	43.0	0.30	3.0
Tucumcari	84	30	57.4	T.	T.
Valley	.....	.....	.....	0.20	
Vermejo	82	14	46.8	0.10	T.
Weed	.....	.....	.....	0.60	
Whiteoaks	.....	.....	.....	0.47	
New York.					
Adams	.....	.....	.....	5.21	1.0
Addison	92	17	51.8	2.96	.....
Akron	.....	.....	.....	2.71	
Amsterdam	84	20	50.4	2.24	T.
Angelica	75	17	47.2	3.04	T.
Appleton	83	23	51.4	2.82	.....
Arcade	83	19	46.8	3.18	3.0
Athens	83	23	52.2	3.55	T.
Atlanta	86	17	49.6	3.77	T.
Atwater	.....	.....	.....	4.05	.....
Auburn	86	22	51.7	4.07	T.
Avon	85[1]	20	53.8[1]	2.71	
Baldwinsville	84	22	51.0	4.20	.....
Ballston Lake	85	20	49.2	2.31	T.
Bedford	78	26	53.8	3.98	
Berlin	85	18	50.3	2.50	T.
Blue Mountain Lake	.....	.....	.....	3.95	1.0
Bolivar	85	17	48.6	4.52	T.
Bouckville	84	18	48.3	3.95	T.
Brockport	83	24	52.1	2.99	
Cape Vincent	75[f]	24	48.5[e]	4.68	
Carmel	74	25	51.1	3.12	
Carvers Falls	82	18	48.2	1.26	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
New York—Cont'd.	°	°	°	*Ins.*	*Ins.*
Chatham	85	21	52.6	3.13	T.
Chazy	75	16	47.9	2.20	T.
Coeymans	83	21	51.4	3.33	T.
Cold Spring Harbor	81	29	54.3	2.69	
Cooperstown	79	21	47.2	3.49	
Cortland	84	20	50.4	4.28	
Cutchogue	79	34	55.8	2.03	
Dekalb	84	17	48.2	4.33	
De Ruyter	87	17	48.8	4.76	T.
Easton	.....	.....	.....	2.85	
Elba	85	22	51.4	2.97	T.
Elmira	93	21	51.9	3.03	
Faust	83	14	45.2	2.86	T.
Fayetteville	88	20	51.2	3.95	.....
Fort Plain	84	22	50.6	3.27	T.
Franklinville	84	18	48.0	4.87	T.
Gabriels	.....	.....	.....	1.95	T.
Gansevoort	.....	.....	.....	2.22	1.0
Glens Falls	77	18	49.9	1.60	
Gloversville	85	19	48.0	3.00	T.
Greenfield	79	20	49.9	2.70	
Greenwich	77	19	49.6	1.72	
Griffin Corners	83	16	47.6	3.11	
Harkness	82	17	47.4	1.94	0.5
Haskinville	.....	.....	.....	3.23	.....
Hemlock	80	22	52.0	2.77	
Hunt	89	16	50.6	1.95	3.0
Indian Lake	87	19	47.2	2.85	.....
Ithaca	86	21	50.6	4.36	
Jamestown	85	23	51.0	3.97	0.6
Jeffersonville	88	18	48.8	2.80	T.
Keene Valley	84	14	47.1	2.98	
Lake George	81	23	49.9	2.30	T.
Le Roy	84	25	51.4	2.73	T.
Liberty	83	25	48.8	3.10	.....
Littlefalls, City Res.	83	23	49.7	3.87	T.
Lockport	81	24	50.8	2.33	.....
Lowville	82	16	46.0	3.96	T.
Lyndonville	.....	.....	.....	2.34	
Lyons	84	21[c]	52.1	6.92	T.
Middletown	84	27	53.4	2.67	.....
Mohonk Lake	77	25	51.5	1.97	
Moira	81	16	47.2	3.55	T.
Mount Hope	82	25	52.3	3.40	.....
Newark Valley	.....	.....	.....	3.58	T.
New Lisbon	82	16	45.8	4.05	T.
North Lake	81	10	41.2	3.20	
Ogdensburg	82	17	48.0	3.56	T.
Oneonta	87	20	50.8	4.05	T.
Otto	82	25	52.8	4.24	0.7
Oxford	81	20	48.9	3.94	T.
Palermo	.....	.....	.....	4.57	
Perry City	84	14	48.9	3.78	.....
Plattsburg	76	25	49.0	2.30	T.
Port Jervis	88	22	51.6	4.31	.....
Potsdam	82	16	48.2	3.69	T.
Richland	87	17	50.9	5.89	.....
Richmondville	85	20	50.8	3.62	T.
Ridgeway	83	25	52.0	2.81	T.
Ripley	81	27	53.0	7.00	.....
Romulus	86	24	53.0	3.26	
Saranac	82	14	45.3	3.43	T.
Scarsdale	77	25	51.3	2.80	.....
Setauket	78	35	55.5	2.54	
Shortsville	86	21	51.8	3.83	.....
Skaneateles	.....	.....	.....	4.98	
Southampton	75	34	54.7	2.57	
South Canisteo	88	17	49.6	3.66	T.
South Kortright	84	18	48.0	3.11	T.
South Schroon	81	15	46.4	2.86	T.
Spier Falls	80	20	49.6	2.13	T.
Straits Corners	94[c]	15[c]	47.3[c]	2.81	.....
Taberg	81	21	48.9	6.79	.....
Ticonderoga	81	22	50.2	2.69	
Volusia	78	25	50.0	4.35	7.0
Wappinger Falls	77	24	52.2	4.07	.....
Warwick	.....	.....	.....	2.72	
Watertown	82	20	49.1	4.30	.....
Waverly	89	16	50.2	3.22	.....
Wedgwood	83	22	49.5	5.28	T.
Wells	86	14	46.0	3.62	T.
West Berne	89	17	50.8	2.33	.....
Westfield	80	27	52.0	7.00	
Windham	83	17	48.8	3.25	.....
Youngstown	.....	.....	.....	2.67	.....
North Carolina.					
Battleboro	.....	.....	.....	1.65	
Beaufort	87	47	67.5	3.01	
Brevard	82	25	56.5	3.72	
Brewers	89	25	57.4	3.09	
Bryson City	.....	.....	.....	4.06	
Buck Springs	72	22	51.4	0.78	
Catawba	.....	.....	.....	1.66	
Chapelhill	89	32	61.2	1.71	
Currituck	.....	.....	.....	1.42	
Eagletown [8]	84	34	59.6	2.17	
Edenton	82	37	60.6	2.64	
Fayetteville	88	35	62.4	2.55	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
North Carolina—Cont'd.	°	°	°	*Ins.*	*Ins.*
Goldsboro	86	35	61.2	2.45	
Graham	.....	.....	.....	1.20	
Greensboro	90	33	59.8	1.08	
Greenville	.....	.....	.....	1.44	
Henderson	86	39	61.6	1.98	
Hendersonville	81	27	56.3	3.42	
Henrietta	89	29	61.2	2.08	
Horse Cove	78	31	55.9	6.07	
Hot Springs	88	32	56.4	.....	
Kinston	92	33	62.4	3.12	
Lenoir	90	26	59.3	3.00	
Lexington	89	28	59.6	2.11	
Lincolnton	89	29	61.2	.....	
Linville	73	16	48.8	3.66	
Louisburg	86	32	60.0	1.25	
Lumberton	92	31	63.2	2.21	
Manteo	86	40	65.5	3.44	
Marion	86[e]	31[e]	58.3[e]	3.26	
Marshall	84	30	58.7	2.51	
Monroe	89	25	59.1	0.97	
Morganton	86	28	57.8	3.01	
Mountairy	88	25	57.1	3.85	
Mount Holly	.....	.....	.....	1.10	
Murphy	.....	.....	.....	4.70	
Nashville	90	30	59.8	1.85	
Newbern	89	35	62.6	3.09	
Patterson [8]	80	28	51.4	3.46	
Pinehurst	90	31	64.8	1.27	
Pink Beds	75	16	49.4	3.85	
Pittsboro	90	32	59.2[e]	1.56	
Ramseur	87	28	58.8	1.26	
Randleman	.....	.....	.....	1.18	
Reidsville	89	32	59.4	2.28	
Salem	88	28	58.4	2.00	
Salisbury	91[f]	27[f]	57.6[f]	1.51	
Scotland Neck	87	35	62.1	2.20	
Selma	84	32	61.6	2.28	
Settle	85	28	58.7	1.98	
Sloan	88	32	62.8	4.98	
Snowhill	90	30	62.4	2.21	
Southern Pines	89	32	62.1	1.71	
Southport	90	40	68.0	3.55	
Statesville	87	27	59.2	2.06	
Tarboro	91	39	65.5	1.62	
Vade Mecum	88	24	56.4	3.10	
Washington	89	33	62.6	3.47	
Waynesville	80	24	54.8	2.64	
Weldon	90	32	60.8	1.37	
Whiteville	88	31	62.4	3.00	
North Dakota.					
Amenia	85	6	43.0	0.76	0.8
Ashley	83	10	38.8	0.02	0.2
Berlin	87	11	39.6	0.62	4.5
Bottineau	76	2	37.1	0.89	T.
Buford	82	14	41.7	0.16	T.
Cando	78[f]	3[f]	39.3[f]	T.	T.
Dickinson	85	9	41.8	0.71	4.0
Donnybrook	80	10	39.4	0.34	0.7
Dunseith	75	2	37.2	T.	T.
Edgeley	86	13	41.0	0.24	2.4
Edmore	83	0	40.0	T.	T.
Fargo	85	9	41.2	1.18	.....
Forman	84	10	42.1	1.12	T.
Fort Berthold	82	7	41.8	0.08	1.0
Fort Yates	86	15	44.4	0.12	0.5
Fullerton	86	13	41.2	0.63	5.0
Glenullin	81[1]	11[1]	43.2[1]	0.06	0.4
Hamilton	80	3	38.3	0.26	0.6
Hannah	75	1	37.8	0.15	.....
Jamestown	93	11	44.4	0.70	7.0
Kulm	84	12	41.8	0.50	4.3
LaFollette	78	6	37.6	0.60	1.0
Lamoure	.....	.....	.....	0.64	.....
Langdon	79	7	39.2	.....	.....
Larimore	85	3	40.0	0.13	1.0
Lisbon	85	6	40.7	1.03	T.
McKinney	77[e]	6[e]	36.8[e]	0.05	0.5
Manfred	80	10	40.8	0.03	T.
Mayville	83	5	42.1	0.42	
Medora	82	10	41.6	0.44	0.4
Melville	84[e]	12[e]	42.4[e]	T.	T.
Milton	79	16	42.5	T.	T.
Minnewaukon [f]	82	10	42.0	.....	
Minot	80	11	38.2	0.64	0.4
Minto	82[e]	6	38.6[e]	0.16	T.
Moyersville	80[e]	10[e]	41.2[e]	0.05	0.5
Napoleon	83	9	38.6	0.28	3.0
New England	88	5	44.2	0.36	0.6
Oakdale	86	12	40.8	0.20	2.0
Oriska	85	5	42.4	0.35	1.5
Park River	80	5	41.0	1.07	1.2
Pembina	80	3	38.0	0.69	0.5
Portal	74	12	37.0	0.20	2.0
Power	83	5	41.8	0.92	T.
Pratt	80	6	38.0	0.05	T.
Rolla	60	4	34.8	0.21	T.
Steele	80	10	39.4	0.45	4.5
University	83	5	41.3	0.28	1.0

TABLE II.—*Climatological record of cooperative observers*—Continued.

Stations.	Temperature. (Fahrenheit.)			Precipitation.	
	Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.
North Dakota—Cont'd.	°	°	°	*Ins.*	*Ins.*
Wahpeton	84	10	43.0	1.57	5.4
Walhalla	79	0	41.0	T.	T.
Washburn	83[c]	12[c]	41.2[c]	T.	.....
Willow City	77	2	37.6	0.22	T.
Wishek	82	11	39.4	T.	T.
Ohio.					
Akron	83	25	52.1	1.75	T.
Amesville	84	27	54.0	5.91	
Atwater	.....	.....	.....	2.90	
Bangorville	79	27	52.1	2.98	T.
Bellefontaine	84	28	51.8	5.13	T.
Benton Ridge	78	25	52.1	2.52	T.
Bladensburg	78	23	51.4	4.22	
Bowling Green	84	21	51.4	1.58	
Bucyrus	84	22	50.9	2.68	
Cadiz	81	28	53.0	3.60	
Cambridge	85	27	55.4	3.14	
Camp Dennison	84	27	54.6	4.64	
Canal Dover	77	25	50.0	3.72	
Canton	76	26	50.4	3.17	
Cardington	81	22	51.0	3.16	
Chillicothe	84	29	50.6	.....	
Circleville	83	29	54.0	4.87	
Clarington	87	31	55.6	4.63	
Clarksville	82	30	55.0	5.71	
Cleveland *a*	78	29	53.0	3.79	
Cleveland *b*	78	30	52.4	3.24	T.
Coalton	84	24	53.9	5.14	
Colebrook	75	25	49.2	4.08	5.0
Dayton	85	26	53.8	3.89	
Defiance	87	23	52.8	1.94	
Delaware	81	23	51.5	3.88	
Demos	82	30	52.6	4.84	
Findlay	80	25	53.1	2.35	
Frankfort	85	28	54.2	3.50	
Fremont	86	25	53.6	1.67	
Garrettsville	81	22	50.4	3.54	T.
Granville	80	26	52.2	5.40	
Gratiot	77	27	51.6	3.56	
Green	82	28	56.4	5.20	
Greenhill	79	21	49.8	4.01	T.
Greenville	80	25	52.5	2.98	
Hedges	84	20	52.4	2.45	
Hillhouse	82	24	50.9	5.90	0.8
Hiram	78	26	50.8	3.77	T.
Hudson	80[c]	23	50.4[b]	2.74	
Ironton	85	31	56.8	4.72	
Jacksonburg	88	29	58.0	5.25	
Kenton	82	20	50.5	2.89	
Killbuck	86	26	51.8	3.88	
Lancaster	78	28	53.2	5.83	
Lima	79	25	51.8	2.04	T.
McConnelsville	83	27	53.0	5.25	
Manara	79	27	51.4	5.99	
Mansfield	.....	.....	.....	2.70	
Marietta	79	33	55.0	6.96	
Marion	85	21	52.4	2.69	
Medina	86	20	52.2	3.17	
Milfordton	84	25	51.1	3.38	T.
Milligan	82	21	52.4	5.76	
Millport	79	22	50.5	4.20	T.
Montpelier	80	23	52.0	3.25	T.
Napoleon	82	23	53.1	1.56	
Nellie[d]	88	30	59.8	.....	T.
New Alexandria	81	25	52.5	3.83	T.
New Berlin	85	25	51.7	2.83	
New Bremen	83	23	52.4	2.98	T.
New Richmond	85	30	55.8	4.78	
New Waterford	81	24	50.6	3.11	
North Lewisburg	79	24	52.6	4.15	
North Royalton	82	28	52.8	2.77	
Norwalk	85	21	52.8	3.01	
Oberlin	82	20	51.8	1.77	
Ohio State University	79	26	51.7	5.65	
Orangeville	83	21	49.1	3.68	2.0
Ottawa	85	22	52.8	2.52	
Pataskala	80	27	52.2	5.82	
Philo	81	29	53.9	4.52	
Plattsburg	80	26	52.6	5.21	
Pomeroy	83	30	55.0	4.64	
Portsmouth	81	32	55.4	4.67	
Pulse	80	27	54.3	3.94	
Rittman	81	23	50.8	2.07	
Rockyridge	86	24	52.9	1.16	
Shenandoah	83	22	50.9	2.53	
Sidney	85	25	53.2	2.52	
Somerset	82	30	53.8	5.82	
South Lorain	82	20	52.5	2.63	
Springfield	.....	.....	.....	4.45	T.
Thurman	85	28	56.8	5.40	
Tiffin	77	26	52.0	2.02	
Toledo (St. Johns College)	84	25	52.6	1.14	
Upper Sandusky	83	22	53.2	2.10	
Urbana	82	22	51.4	4.66	
Vickery	86	21	52.5	1.49	
Warren	84	28	51.9	3.09	
Wauseon	85	21	51.2	1.85	
Waverly	86	26	54.7	5.34	
Waynesville	79	28	53.6	5.15	
Wellington	81	20	51.1	2.28	
Willoughby	.....	.....	.....	3.02	
Wilson	84	25	54.0	3.82	
Wooster	80	23	51.0	2.32	T.
Zanesville	.....	.....	.....	3.30	
Oklahoma.					
Alva	84	35	57.4	1.41	
Arapaho	88	28	60.0	1.25	
Beaver	91	18	54.7	1.20	
Blackburn	92	27	59.9	4.93	T.
Chandler	88	25	61.4	1.57	
Cloud Chief	87	26	58.2	0.68	
Enid	88	28	58.0	2.35	T.
Erick	85	25	58.5	1.30	
Fort Reno	88	28	61.9	1.64	
Fort Sill	88	27	61.8	1.96	
Gage	85	20	55.1	0.33	T.
Grand	.....	.....	.....	1.13	
Guthrie	85	30	59.8	1.93	
Harrington	84	24	56.6	0.67	
Hennessey	90	28	61.0	2.06	
Hobart	88	29	61.2	0.75	
Jefferson	89	28	58.2	2.25	
Jenkins	87	26	57.8	1.04	
Kenton	87	20	55.4	0.25	T.
Kingfisher	88	29	60.0	1.97	
McComb	86	25	58.3	1.40	
Mangum	95	32	63.5	0.75	
Meeker	88	22	58.4	0.69	
Newkirk	89	27	59.6	1.48	
Norman	87	25	58.5	0.84	
Okeene	88	27	60.0	1.49	
Perry	88	29	59.4	2.80	
Sac and Fox Agency	85	30	60.2	2.56	
Shawnee	87	30	60.6	3.27	
Stillwater	89	28	58.0	2.88	
Taloga	85[c]	21[b]	51.2[c]	1.12	
Temple	89	31	62.7	2.74	
Watonga	88	26	58.8	2.75	
Waukomis	88	29	60.8	2.35	
Weatherford	85	29	57.4	1.39	T.
Whiteagle	84	30	58.8	4.65	T.
Oregon.					
Alba	.....	.....	.....	2.23	
Albany	.....	.....	.....	4.74	
Alpha	76	27	51.9	9.71	
Arlington	75	21	48.4	.....	
Ashland	79	31	53.2	0.79	
Astoria	68	37	51.6	8.60	
Aurora (near)	68	28	50.2	5.01	
Bay City	73	28	50.6	8.67	
Beulah	82	10	41.0	0.45	0.5
Blackbutte	65	39	46.1	4.65	
Blalock	75	24	51.0	1.43	
Bullrun	.....	.....	.....	9.58	
Burns	77	13	44.9	0.55	2.0
Carlton	70	26	49.4	3.66	
Cascade Locks	69	30	46.7	9.41	
Coquille	.....	.....	.....	6.32	
Corvallis	72	28	50.6	4.75	
Dale	.....	.....	.....	1.52	1.0
Dayville	82	18	47.2	0.73	T.
Doraville	70	26	47.8	5.73	
Drain	78	26	52.2	4.36	
Echo	78	20	48.3	1.03	
Ella	72	22	46.3	1.20	
Eugene	72	30	50.7	4.49	
Fairview	85	31	54.1	5.91	
Falls City	66	27	48.0	6.78	
Forestgrove	69	24	49.0	4.61	
Gardiner	78	37	52.8	7.78	
Glendale	80	28	52.6	2.39	
Glenora	65	25	45.5	11.65	
Gold Beach	71	32	51.4	4.71	
Government Camp	59	19	39.3	11.03	29.0
Granite	.....	.....	.....	2.25	12.0
Grants Pass	90	24	52.5	1.12	
Grass Valley	67	16	41.8	1.36	T.
Heisler	77	17	45.7	.....	.....
Heppner	80	23	46.2	2.84	
Hood River	69	26	47.8	3.57	
Huntington	82	14	45.6	0.00	
Jacksonville	84	27	52.7	0.53	
John Day	86	20	47.8	0.92	T.
Joseph	76	15	41.5	1.19	3.5
Kerby	79	25	51.4	2.22	
Klamath Falls	92	17	48.0	0.40	
Lagrande	83	17	44.4	1.87	T
Lakeview	78	17	45.5	0.22	
Lonerock	78	18	43.2	0.65	4.0
McKenzie Bridge	78	24	49.7	7.73	
McMinnville	71	25	50.6	4.55	
Marshfield	78	33	53.2	5.91	
Mill City	78	25	49.2	6.44	
Monroe	72	28	50.6	4.91	
Mount Angel	74	31	51.3	6.37	
Nehalem	.....	.....	.....	9.59	
Oregon—Cont'd.	°	°	°	*Ins.*	*Ins.*
Newport	74	35	52.5	7.07	
Odell	.....	.....	.....	0.69	.....
Paisley[1]	75	19	42.4	.....	
Pendleton	74	29	44.4	1.52	
Port Oxford	71	40	53.2	6.65	
Prineville	75	13	43.2	0.51	T.
Salem	68	30	50.6	4.26	
Silverlake	75[c]	9[c]	38.6[c]	0.55	
Sparta	75	15	43.6	1.10	6.0
Stafford	68	34	50.4	5.80	
The Dalles	71	22	48.2	1.88	
Tipton	.....	.....	.....	1.80	12.0
Toledo	71	30	52.0	8.81	
Umatilla	73	21	49.9	0.68	
Vale	85	13	45.8	0.00	
Vancycle	.....	.....	.....	1.40	
Wallowa	80	16	43.3	1.48	0.5
Wamic	70	21	43.0	0.63	1.0
Warm Spring	83	17	47.6	1.16	0.5
Weston	79	16	43.7	3.67	
Pennsylvania.					
Aleppo	85	25	53.4	4.71	
Altoona	84[d]	24[d]	51.0[d]	3.94	
Beaver Dam	.....	.....	.....	3.67	
Bellefonte	85	25	54.5	3.51	
Brookville	.....	.....	.....	5.48	
Browers	.....	.....	.....	4.63	
California	84	28	55.6	4.84	
Cassandra	80	27	49.8	3.42	T.
Centerhall	85	24	53.6	3.50	
Clarion	.....	.....	.....	5.24	
Claysville	81	25	53.4	3.79	
Coatsville	90	28	53.4	5.13	
Confluence	.....	.....	.....	4.36	
Davis Island Dam	.....	.....	.....	2.83	
Derry	85	27	53.0	4.43	
Doylestown	.....	.....	.....	3.79	
East Mauch Chunk	90	22	53.2	5.25	
Easton	80	30	53.7	4.18	
Ellwood Junction	.....	.....	.....	4.67	
Emporium	80	23	51.4	5.82	
Ephrata	89	27	54.8	4.36	
Everett	84	24	51.6	3.98	T.
Forks of Neshaminy	.....	.....	.....	3.70	
Franklin	82	20	51.0	4.30	
Freeport	88	28	54.6	3.78	
Gettysburg	84	28	53.8	4.15	
Girardville	.....	.....	.....	5.90	
Gordon	86	21	50.7	6.12	
Greensboro	.....	.....	.....	4.86	
Greenville	82	23	50.8	5.52	3.0
Hamburg	88	28	53.8	7.06	
Hanover	87	28	56.5	4.13	T.
Herrs Island Dam	.....	.....	.....	3.47	
Huntingdon	90	28	54.4	4.85	
Indiana	81	28	51.6	5.45	T.
Irwin	87	25	55.2	4.14	
Johnstown	.....	.....	.....	4.82	T.
Keating	.....	.....	.....	4.04	
Lansdale	.....	.....	.....	3.62	
Lawrenceville	90	23	50.9	2.18	
Lebanon	89	26	54.2	5.46	
Leroy	84	19	50.8	3.62	
Lewisburg	87	24	53.4	4.03	
Lockhaven	90	22	54.3	3.88	
Lock No. 4	.....	.....	.....	3.76	
Lycippus	85	30	54.8	4.92	
Marion	81	27	53.0	3.38	
Mifflintown	85	24	52.6	4.07	
Milford	85	19	51.0	3.76	
Montrose	85	21	49.8	3.19	
New Germantown	86	25	53.8	3.55	
Ottsville	.....	.....	.....	3.83	
Parker	.....	.....	.....	4.02	T.
Philadelphia	86	36	58.0	4.12	
Pocono Lake	85	16	48.4	4.77	
Point Pleasant	.....	.....	.....	3.56	
Pottsville	.....	.....	.....	6.05	
Reading	89	28	55.2	4.76	
Renovo	.....	.....	.....	3.96	
Saegerstown	83	20	50.4	4.08	T.
St. Marys	83	23	50.1	5.51	
Saltsburg	.....	.....	.....	3.83	
Seisholtzville	.....	.....	.....	4.38	
Selinsgrove	82	24	53.6	3.79	
Shawmont	.....	.....	.....	3.69	
Skidmore	85	25	51.0	3.53	T.
Smiths Corners	.....	.....	.....	3.83	
Somerset	85	25	50.2	5.29	0.2
South Eaton	82	25	52.5	3.51	
Springdale	.....	.....	.....	4.14	
Springmount	.....	.....	.....	3.66	
State College	82	26	51.1	2.83	
Swarthmore	86[b]	32[d]	57.0[c]	3.72	
Towanda	86	21	50.8	3.79	
Uniontown	82	29	54.7	5.56	
Warren	86	22	51.5	5.13	
Wellsboro[b]	87	29	55.0	.....	

TABLE II.—*Climatological record of cooperative observers*—Continued.

Stations.	Temperature. (Fahrenheit.)			Precipitation.	
	Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.
Pennsylvania—Cont'd.	°	°	°	*Ins.*	*Ins.*
Westchester	89	32	56.4	4.90	
West Newton	.....	.....	.....	3.92	
Wilkesbarre	82	27	53.2	3.32	
Williamsport	83	27	53.8	3.18	
Rhode Island.					
Bristol	75	31	54.2	1.95	
Kingston	79	27	51.8	1.75	
Narragansett	76	30	52.8	2.03	
Pawtucket	83	33	54.6	1.90	
Providence *a*	80	31	54.6	2.16	
South Carolina.					
Aiken	88	42	69.9	1.70	
Anderson	90	32	63.4	2.28	
Barksdale	84°	37°	59.7°	1.52	
Beaufort	89	42	69.2	2.12	
Bennettsville	90°	34°	61.2	.....	
Bowman	90	33	64.9	2.22	
Blair	.....	.....	.....	0.90	
Calhoun Falls	.....	.....	.....	1.53	
Camden	.....	.....	.....	1.60	
Chappell	.....	.....	.....	1.28	
Cheraw	86	35	61.6	1.65	
Clarks Hill	92	37	64.8	1.73	
Clemson College	85	33	63.2	3.51	
Conway	86	35	64.6	3.20	
Dillon	90	32	63.6	2.75	
Due West	87	40	64.0	1.66	
Edisto	.....	.....	.....	1.20	
Effingham	.....	.....	.....	2.70	
Enoree	.....	.....	.....	1.35	
Florence	90	34	63.8	3.28	
Gaffney	92	32	62.6	1.32	
Georgetown	87	44	67.0	3.05	
Greenville	83	34	58.8	3.32	
Heath Springs	90	33	59.6	1.49	
Kingstree	90	42	67.0	1.48	
Liberty	86	33	61.2	5.20	
Little Mountain	89	35	63.3	1.14	
Lugoff	90	33	62.2	0.94	
Newberry	91	34	63.1	1.72	
Pelzer	.....	.....	.....	2.50	
St. George	87	37	65.0	0.60	
St. Matthews	87	40	63.9	2.35	
St. Stephens	.....	.....	.....	1.26	
Saluda	92	30	63.6	1.25	
Santuck	90	34	62.6	0.96	
Seivern	91	29	62.7	1.15	
Smiths Mills	.....	.....	.....	3.30	
Society Hill	83	36	61.0	2.91	
Spartanburg	88	36	61.2	2.10	
Summerville	85	39	65.8	2.16	
Trenton	88	40	64.8	1.71	
Trial	90	33	64.2	1.44	
Walhalla	86	33	60.4	4.95	
Walterboro	89	36	66.8	1.86	
Winnsboro	85	41	63.6	1.16	
Yemassee	89	35	65.4	2.80	
Yorkville	90	38	63.8	0.98	
South Dakota.					
Aberdeen	87	14	41.7	3.47	8.5
Academy	90	18	47.0	2.31	5.0
Alexandria	93	20	47.0	2.16	3.0
Armour	95	15	47.9	2.91	7.0
Ashcroft	85	1	41.0	1.02	6.0
Bowdle	95	9	42.7	1.12	9.0
Brookings	83	15	43.4	1.50	6.0
Canton	91	19	47.2	1.78	9.0
Centerville	89	21	48.2	1.73	10.8
Chamberlain	94	17	48.2	2.01	1.7
Clark	90	12	43.5	2.62	12.0
Doland	83	15	43.5	2.82	3.0
Elkpoint	91	22	50.1	2.18	2.0
Fairfax	91	24	46.8	1.79	1.0
Farmingdale	.....	.....	.....	0.90	5.0
Faulkton	89	14	42.0	1.69	14.0
Flandreau	86	15	45.0	1.93	8.0
Forestburg	93	16	44.9	2.12	3.0
Fort Meade	88	5	41.1	4.95	9.2
Gannvalley	90	17	46.3	1.65	3.0
Grand River School	89	5	43.9	1.10	9.5
Greenwood	93	20	49.8	2.58	3.0
Highmore	92	11	43.4	1.95	5.0
Hotch City	91	6	45.0	1.65	7.5
Howell	90	13	42.4	1.81	8.5
Howard	88	18	45.8	1.90	T.
Ipswich	89	9	40.2	1.63	14.0
Kidder	85	7	41.0	0.84	5.0
Kimball	92	16	46.0	1.71	2.0
Marion	93°	16°	49.0°	2.06	3.0
Mellette	96	7	44.2	2.65	5.0
Menno	88	22	47.2	2.10	6.4
Mil'bank	85	11	43.4	3.00	5.5
Mitchell	91	19	45.6	2.47	6.5
Pine Ridge	90	10	44.1	0.60	4.0
Plankinton	88	17	47.2	2.17	7.0
Ramsey	92	14	45.0	2.62	12.0
Redfield	88	12	42.2	2.60	5.0
Rosebud Agency	91	6	45.1	1.60	3.8

Stations.	Temperature. (Fahrenheit.)			Precipitation.	
	Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.
South Dakota—Cont'd.	°	°	°	*Ins.*	*Ins.*
Rosseau	.....	.....	.....	1.52	9.5
Sioux Falls	92	16	47.4	2.06	6.5
Spearfish	85	11	43.4	2.25	.....
Stephan	94	18	44.1	1.79	7.0
Tyndall	94	23	48.8	1.84	2.8
Vermillion	87	22	49.0	2.43	1.2
Watertown	84	12	41.9	2.02	3.5
Wentworth	95	17	45.6	1.29	3.9
Whitehorse	90	— 1	41.8	0.84	7.0
Woolsey	.....	.....	.....	1.99	3.0
Tennessee.					
Andersonville	88	.....	.....	5.70	
Arlington	85	32	60.1	6.98	
Ashwood	86	30	59.6	5.35	
Benton	90	29	61.6	4.52	
Bluff City	.....	.....	.....	2.80	
Bolivar	85	33	59.3	11.95	
Bristol	84	28	57.2	3.22	
Brownsville	84	35	60.4	4.69	
Byrdstown	82	31	58.8	6.56	
Carthage	90	32	61.1	7.34	
Cedar Hill	87	30	59.6	3.32	
Charleston	.....	.....	.....	4.33	
Clarksville	84	33	60.0	2.61	
Clinton	.....	.....	.....	3.60	
Covington	83	34	61.0	6.61	
Decatur	85	30	60.4	5.70	
Dickson	87	28	59.2	4.91	
Dover	90	32	61.1	3.29	
Dyersburg	85	31	59.6	5.35	
Elizabethton	85	28	56.8	2.54	
Erasmus	83	24	57.2	7.31	
Florence	84	33	60.2	7.03	
Franklin	83	32	58.8	5.80	
Greeneville	85	28	58.5	3.70	
Halls Hill	.....	.....	.....	6.92	
Hamilton Springs	84	31	60.4	7.07	
Harriman	84	30	59.2	4.57	
Hohenwald	86	23	57.0	5.64	
Iron City	85	30	60.6	6.69	
Isabella	81	31	59.2	4.08	
Jackson	86	33	62.6	7.13	
Johnsonville	85	31	60.1	4.86	
Jonesboro	89	27	59.8	4.13	
Kenton	87	29	60.0	4.38	
Kingston	.....	.....	.....	4.66	
Lafayette	87	29	58.7	4.87	
Leadvale	.....	.....	.....	2.80	
Lewisburg	88	31	61.4	6.84	
Liberty	90	31	61.9	6.29	
Loudon	.....	.....	.....	4.60	
Lynnville	82	35	60.5	8.40	
McGee	.....	.....	.....	4.60	
McMinnville	86	28	60.3	6.33	
Maryville	89	30	60.2	4.05	
Milan	83	33	59.1	5.86	
Newport	85	30	58.5	3.52	
Palmetto	90	29	61.0	6.58	
Pope	88	29	61.4	6.25	
Rogersville	89	29	59.4	3.14	
Rugby	82	22	56.3	6.66	
Savannah	83	32	60.8	4.78	
Sewanee	80	31	58.0	5.38	
Silver Lake	76	24	52.1	2.89	
Springdale	85	29	59.4	5.28	
Springville	86	28	59.7	3.69	
Tazewell	.....	.....	.....	4.84	
Tellico Plains	80	29	61.4	3.54	
Tracy City	79	27	57.6	6.56	
Trenton	87	30	60.6	5.18	
Tullahoma	85	29	60.1	6.26	
Union City	88	31	60.8	3.05	
Walling	.....	.....	.....	6.02	
Waynesboro	84	29	59.6	5.07	
Wildersville	87	33	60.2	6.21	
Texas.					
Albany	90	38	64.4	3.27	
Alvin	.....	.....	.....	1.49	
Arthur	.....	.....	.....	12.24	
Austin	93	47	69.5	2.06	
Ballinger	91	38	64.5	1.82	
Beaumont	99	43	72.7	2.22	
Beeville	97	45	72.2	4.13	
Big Spring	93	36	63.8	1.79	
Blanco	97	35	68.3	2.42	
Boerne	92	34	67.4	2.10	
Bonham	89	35	66.0	6.44	
Booth	.....	.....	.....	2.43	
Bowie	89	38	65.0	6.06	
Brazoria	91	41	70.9	1.97	
Brenham	93	44	70.1	1.19	
Brighton	91	48	74.6	0.59	
Brownwood	95	36	64.6	4.02	
Channing	86	27	56.2	0.45	
Childress	94	35	63.2	0.50	
Claytonville	86	34	61.2	1.56	
Coleman	92	42	66.9	0.97	
College Station	97	42	70.4	4.48	

Stations.	Temperature. (Fahrenheit.)			Precipitation.	
	Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.
Texas—Cont'd.	°	°	°	*Ins.*	*Ins.*
Colorado	87	33	63.0	1.69	
Columbus	.....	.....	.....	3.65	
Corsicana	98	42	67.6	4.19	
Cotulla	82	54	71.0	0.25	
Crockett	100	40	70.2	3.31	
Cuero	95	45	72.6	1.10	
Dallas	94	35	65.1	1.89	
Danevang	96	42	71.0	4.80	
Decatur	90	36	73.0	5.40	
Dialville	89	39	66.7	5.30	
Duval	95	44	69.4	3.01	
Eagle Pass	98	40	68.6	2.80	
Fort Brown	93	52	76.6	3.17	
Fort Clark	92	41	71.4	1.03	
Fort Davis	83	32	58.8	0.95	
Fort McIntosh	98	42	74.1	0.69	
Fort Ringgold	104	42	75.9	1.47	
Fort Stockton	91	35	61.4	0.59	
Fredericksburg	92°	34°	64.2°	2.88	
Gainesville	92	32	64.4	2.88	
Georgetown	95	41	68.3	3.27	
Gonzales	.....	.....	.....	3.86	
Graham	90	33	64.0	1.37	
Grapevine	96	36	66.7	3.22	
Greenville	95	37	65.9	3.85	
Hale Center	81	26	58.4	0.00	
Hallettsville	95	45	72.2	2.36	
Haskell	93	36	63.8	0.60	
Hearne	96	40	69.8	1.72	
Hempstead	.....	.....	.....	1.00	
Henrietta	97	31	64.0	1.64	
Hewitt	.....	.....	.....	3.90	
Hilisboro	93	37	66.6	1.45	
Hondo	94	42	71.2	1.41	
Huntsville	98	40	68.1	1.72	
Jefferson	88	37	65.1	3.48	
Junction	.....	.....	.....	1.64	
Kaufman	93	39	67.6	2.54	
Kent	95	30	63.6	0.04	
Kerrville	93	31	66.6	4.76	
Knickerbocker	92	34	65.8	2.25	
Kopperl	.....	.....	.....	2.68	
Lampasas	90	38	65.7	7.19	
La Para	.....	.....	.....	0.40	
Liberty	98	37	71.1	2.65	
Llano	97	35	66.4	0.08	
Longlake	.....	.....	.....	3.67	
Longview	91	40	65.2	1.80	
Luling	95	44	71.0	3.12	
Mann	96	39	67.4	4.87	
Marlin	98	41	68.7	4.83	
Menardville	.....	.....	.....	2.38	
Mexia	95	41	66.6	3.79	
Miami	85	22	55.0	0.69	
Mobeetie	84	30	57.2	0.40	
Mount Blanco	.....	.....	.....	2.45	
Mount Pleasant	90	38	65.4	5.80	
Nacogdoches	92	36	65.8	1.78	
New Braunfels	94	44	70.7	2.57	
Panter	.....	.....	.....	3.17	
Paris	92	40	64.6	8.21	
Pearsall	95	44	72.8	2.47	
Port Lavaca	93	48	73.3	1.51	
Rhineland	90	53	62.3	0.25	
Riverside	.....	.....	.....	1.42	
Rockland	96	45	71.8	2.48	
Rockport	84	52	68.6	0.40	
Runge	.....	.....	.....	1.28	
Sabinal	100	39	71.8	1.71	
San Saba	99	35	66.2	5.16	
Santa Gertrude	.....	.....	.....	0.39	
Seymour	89	32	61.9	0.98	
Sherman	85	39	64.0	5.05	
Sonora	90	31	65.8	1.95	
Sugarland	92	44	71.5	2.01	
Sulphur Springs	90	37	65.2	3.67	
Temple	90	39	65.4	2.86	
Trinity	99	35	69.4	3.33	
Tyler	90	40	65.3	2.00	
Valley Junction	.....	.....	.....	2.02	
Victoria	95	48	72.3	3.19	
Waco	96	43	71.2	2.39	
Waxahachie	95	37	65.4	1.07	
Weatherford	94	40	68.8	4.47	
Wharton	91	41	74.4	2.53	
Wichita Falls	.....	.....	.....	1.90	
Willspoint	94	40	65.6	5.57	
Utah.					
Alpine	.....	.....	.....	0.15	
Alta	.....	.....	.....	1.39	21.8
Blackrock	79	13	44.8	0.88	
Blacksmith Fork	.....	.....	.....	1.10	7.0
Castledale	76	4	41.3	0.80	
Castle Rock	.....	.....	.....	0.85	7.0
Corinne	82	18	45.6	0.22	
Deseret	82	10	44.9	T.	
Experiment Farm	89	26	56.3	.....	
Farmington	77	20	45.0	0.06	0.3

TABLE II.—*Climatological record of cooperative observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Utah—Cont'd.	°	°	°	*Ins.*	*Ins.*
Fillmore	88	19	50.9	0.51	
Fort Duchesne	80	16	44.2	0.28	2.0
Frisco	77	23	48.8	0.89	.....
Garrison	85	12	45.6	0.00	
Giles	85	11	47.8	0.42	
Government Creek	83	18	44.8	0.10	T.
Grayson	99	23	54.2	0.02	
Heber	78	10	42.2	0.31	3.0
Henefer	82	4	41.2	0.86	7.5
Hite	89	30	58.0	0.15	
Huntsville	.....	.....	.....	0.45	3.0
Ibapah	81	4	40.0	0.00	
Kanab	76	18	46.8	0.90	
Kelton [1]	86	10	44.2	T.	
La Sal	72[3]	14[3]	43.6[3]	0.16	
Levan	77	15	44.2	0.12	T.
Loa	72	5	39.6	0.10	
Logan	80	19	45.8	0.37	
Lucin	86	12	43.4	T.	T.
Manti	77[a]	11[a]	44.4[a]	0.54	
Marion	.....	.....	.....	0.43	8.0
Marysvale	84	7	44.8	0.46	
Meadowville	80	9	38.5	0.75	7.0
Millville	.....	.....	.....	0.71	
Moab	86	20	51.1	0.12	
Morgan	79	4	42.1	0.78	4.5
Mount Nebo	80[3]	18[3]	45.9[3]	0.15	
Mount Pleasant	80	14	45.0	0.00	
Nephi	.....	.....	.....	0.05	
Oak City	84	16	49.4	0.15	
Ogden	79	22	45.8	0.29	T.
Panquitch	.....	.....	.....	0.31	
Parowan	78	17	45.4	0.12	
Payson	.....	.....	.....	0.46	
Pinto	74	15	42.6	0.77	
Plateau	79	0	42.0	0.22	0.2
Provo	66[1]	19[1]	43.6[1]	0.33	
Ranch	74	16	44.7	0.60	.....
Randolph	.....	.....	.....	0.47	6.8
St. George	92	30	57.0	0.55	
Salt Air	82	24	48.3	0.25	
Scipio	83	7	45.4	0.53	
Snowville	79	7	41.0	T.	T.
Soldier Summit	71	2	37.2	0.00	
Sunnyside	.....	.....	.....	0.20	T.
Thistle	86	2	43.8	0.35	T.
Tooele	78	25	47.0	0.55	
Tropic	75	15	49.8	T.	
Trout Creek	87	11	45.4	0.00	
Vernal	73	16	41.3	0.15	1.2
Vermont.					
Burlington	76	27	51.4	2.59	T.
Cavendish	76[c]	15[c]	47.4[c]	1.74	
Chelsea	72	16	44.2	1.10	T.
Cornwall	79	21	49.6	2.55	
Enosburg Falls	76	15	45.7	2.89	1.0
Jacksonville	79	15	46.8	3.63	T.
Manchester	78	20	48.1	1.61	
Norwich	73	15	45.5	1.54	T.
St. Johnsbury	78	16	47.4	1.60	
Wells	75	20	47.5	1.60	
Westfield	.....	.....	.....	2.23	
Woodstock	79	15	46.4	1.71	
Virginia.					
Alexandria	85	30	57.6	2.14	
Arvonia	88	25	56.6	2.21	
Ashland	86	30	58.6	0.66	
Barboursville	83	30	58.2	4.00	
Bigstone Gap	83	28	56.7	4.12	
Blacksburg	84	19	52.0	3.01	T.
Buchanan	.....	.....	.....	3.58	
Burkes Garden	78	15	50.0	3.41	T.
Callaville	84	30	60.3	2.01	
Cape Henry	85	44	62.7	1.85	
Charlottesville	86[b]	35	.....	2.57	
Clarksville	.....	.....	.....	2.02	
Columbia	87	30	57.4	2.73	
Dale Enterprise	88	23	54.5	2.96	
Danville	.....	.....	.....	1.81	
Dinwiddie	90	23	57.0	0.72	T.
Fredericksburg	84	30	57.2	2.28	
Grahams Forge	78[c]	21[c]	52.0[c]	2.68	
Hampton	85	40	62.3	1.70	
Hot Springs	78	22	50.4	3.30	
Ivanhoe	.....	.....	.....	2.24	
Lexington	87	24	54.4	2.54	
Lincoln	90	25	56.0	2.81	
Marion	82	24	54.4	2.54	
Mendota	.....	.....	.....	3.04	
Newport News	87	41	62.8	2.14	
Nokesville (near)	83	32	55.8	2.85	
Petersburg	88	25	57.0	1.12	
Quantico	86	29	57.6	2.21	
Radford	.....	.....	.....	0.52	
Randolph	.....	.....	.....	2.03	
Riverton	.....	.....	.....	2.73	
Roanoke	89	.....	.....	2.90	
Rockymount	84	26	55.8	3.46	
Virginia—Cont'd.					
Saxe	89	26	57.2	2.26	
Shenandoah	.....	.....	.....	2.63	
Speers Ferry	.....	.....	.....	4.24	
Spottsville	88	29	59.6	1.49	
Staunton	86	26	56.6	2.37	
Stephens City	90	26	56.4	3.51	
Warsaw	87	27	59.3	1.90	
Williamsburg	87	31	57.4	2.00	
Woodstock	93	26	56.6	3.01	
Washington.					
Aberdeen	74	28	49.8	11.60	
Anacortes	59	29	47.2	2.41	
Ashford	.....	.....	.....	7.81	
Bellingham	64	24	47.2	2.44	
Blaine	60	25	44.9	5.66	
Brinnon	62	28	47.2	6.46	T.
Cedonia	56	14	38.6	3.08	2.6
Centralia	72	22	48.2	5.47	
Cheney	66	14	42.6	4.28	3.0
Clearwater	65	26	46.2	10.02	
Clearbrook	62	23	44.2	5.62	
Cle Elum	64	12	42.4	3.09	T.
Colville	65	13	40.8	2.22	3.0
Conconully	66	11	40.2	1.12	
Coupeville	64	26	49.0	2.30	
Crescent	61	12	39.8	2.82	2.0
Cusick	62	13	40.7	3.19	
Danville	65	16	41.2	2.51	1.5
Dayton	75	21	47.0	3.07	
Easton	.....	.....	.....	5.14	1.0
East Sound	63[b]	25[b]	45.4[b]	3.62	
Ellensburg	60	11	40.0	1.42	
Fort Simcoe	.....	.....	.....	1.66	
Grandmound	69	19	46.6	5.56	
Granite Falls	.....	.....	.....	6.51	
Hatton	72	17	46.6	1.81	
Horse Heaven	.....	.....	.....	0.90	
Ilwaco	75	30	50.6	9.08	
Kennewick	72	15	48.0	0.78	
Kiona	70	15	47.3	1.19	
Kosmos [4]	72	25	47.8	.....	
Lacenter	68	26	47.8	6.34	
Lakeside	66	25	46.0	1.47	
Lester	68	23	46.8	4.67	T.
Lind	68	20	44.8	2.23	0.4
Loomis	73	23	44.6	0.80	
Merritt	.....	.....	.....	7.37	1.0
Mottinger Ranch	82	25	51.4	0.81	
Mount Pleasant	67	29	49.6	7.06	
Moxee	69	13	45.2	1.32	
Northport	62	11	39.4	3.10	T.
Odessa	.....	.....	.....	1.96	T.
Olga	58	30	46.6	3.23	
Olympia	67	23	47.2	7.36	
Pinehill	67	22	47.4	2.68	T.
Pomeroy	74	19	45.2	2.04	T
Port Townsend	62	31	48.6	2.20	
Pullman	71	22	43.4	2.29	1.0
Rattlesnake	60	23	41.8	2.98	1.0
Republic	59	11	38.7	2.06	3.0
Rock Lake	.....	.....	.....	3.22	T.
Rosalia	64	16	41.7	3.80	1.5
Sedro	68	26	46.8	4.92	
Silvana	65[1]	22[1]	45.5[1]	2.70	
Snohomish	65	24	46.8	5.44	
Snoqualmie	66[4]	24[4]	45.4[4]	6.61	
Southbend	.....	.....	.....	8.55	
Sunnyside	68	15	44.8	1.72	
Tekoa	.....	.....	.....	3.16	1.0
Touchet	83	16	48.0	0.64	
Twisp	73	19	42.9	1.66	
Union	64	24	47.7	10.28	
Vancouver	72	27	51.0	4.15	
Vashon	61	31	48.3	5.70	
Wahluke	75[c]	21[c]	48.2[c]	0.40	
Waterville	60	15	39.1	1.69	2.0
Wenatchee (near)	68	20	42.1	1.74	
Wilbur	60	16	40.6	3.03	0.5
Zindel	83[4]	25[4]	49.5[4]	0.70	
West Virginia.					
Bancroft	86	30	57.7	7.52	
Bayard	79	19	48.8	4.08	1.0
Beckley	79	23	53.0	.....	
Bens Run	83	31	55.1	5.98	
Berkley Springs	92	26	56.8	3.77	
Bluefield	82	29	55.4	2.90	T.
Buckhannon	82	24	52.0	4.17	T.
Burlington	84	23	51.6	3.65	
Cairo	87	26	56.0	8.26	
Central	88	24	53.4	7.02	
Charleston	83	34	58.2	5.31	
Creston	85	27	54.7	5.72	
Cuba	83	26	54.8	6.10	
Doane	88	26	53.1	3.90	
Durbin	78	19	49.0	.....	
Elkhorn	82	27	56.2	2.75	
Fairmont	84	26	53.2	6.16	
Glenville	86	30	56.5	7.55	
West Virginia—Cont'd.					
Grafton	85	24	54.8	5.08	T.
Green Sulphur Springs	82	20	54.8	2.52	
Harpers Ferry	.....	.....	.....	2.87	
Hinton	.....	.....	.....	2.93	
Huntington	84	30	54.4	4.14	
Lewisburg	84	20	52.6	2.87	
Logan	88	33	58.4	5.25	
Lost Creek	85	25	52.3	6.30	
Madison	87	29	55.6	4.57	
Mannington	88	26	54.1	5.35	
Martinsburg	86	28	54.2	3.35	
Moorefield	95	20	56.6	2.69	
Morgantown	83	29	55.6	4.98	
Moundsville	83	29	54.4	4.72	
New Cumberland	79	25	52.6	4.40	
New Martinsville	88	29	56.7	4.70	
Nuttallburg	71	22	46.4	3.40	
Oceana	86	29	55.4	4.70	
Parsons	86	20	52.0	5.78	
Philippi	85	22	52.8	5.31	T.
Pickens	.....	.....	.....	2.46	1.0
Point Pleasant	80	31	55.7	5.60	
Powellton	85	28	57.0	3.25	
Princeton	73	18	48.3	3.65	
Romney	89	26	56.3	3.35	T.
Rowlesburg	.....	.....	.....	5.35	
Ryan	83	26	53.3	6.66	
Smithfield	84	25	51.8	6.04	
Southside	83	29	55.7	7.61	
Sutton	92[c]	28[c]	57.6[c]	4.76	
Terra Alta	80	28	55.1	5.28	1.0
Union	82	21	54.0	2.89	
Uppertract	87	21	53.7	3.02	T.
Valley Fork	88	25	56.3	4.42	
Weston	.....	.....	.....	5.97	
Wheeling	81	30	58.8	3.77	
Williamson	80	26	51.0	4.00	
Wisconsin.					
Amherst	86	10	46.8	2.24	1.0
Antigo	80	18	43.8	.....	.....
Appleton	81	20	49.2	1.35	0.5
Appleton Marsh	83	11	45.6	3.18	3.2
Ashland	82	13	44.3	3.42	T.
Barron	84	10	44.8	2.40	1.5
Beloit	82	19	49.2	3.20	.....
Berlin	83	11	46.0	3.14	T.
Black River Falls	.....	.....	.....	3.10	
Burnett	82	15	47.4	2.33	T.
Chilton	82	19	48.2	2.49	T.
Chippewa Falls	.....	.....	.....	3.13	
Darlington	.....	.....	.....	4.28	.....
Downing	84	9	43.4	3.15	4.0
Eau Claire	84	11	46.6	3.68	1.0
Fond du Lac	82	13	46.9	2.15	T.
Grand Rapids	83	10	47.3	1.95	T.
Grand River Locks	.....	.....	.....	2.50	T.
Grantsburg	81	10	43.9	3.20	5.0
Hancock	82	14	46.7	2.99	T.
Harvey	83	17	48.2	4.34	T.
Hayward	80	4	46.6	3.07	2.7
Hillsboro	84	10	46.0	3.35	T.
Koepenick	90	5	45.2	2.40	7.0
Lancaster	82	28	49.0	2.62	.....
Manitowoc	83	20	47.4	2.47	T.
Mauston	81	15	47.7	2.89	T.
Meadow Valley	85	10	46.3	3.00	2.0
Medford	84	10	45.0	1.39	1.0
Menasha	.....	.....	.....	2.87	T.
Merrill	89	9	44.3	1.92	0.2
Minocqua	76	15	43.5	1.90	3.0
Mount Horeb	84	17	48.4	2.89	T.
Neillsville	84	14	46.4	3.58	1.5
New London	85	14	47.2	2.40	
New Richmond	84	10	44.9	2.57	2.0
Oconto	84	14	47.2	2.24	
Osceola	84	9	44.2	2.62	7.0
Oshkosh	82	17	48.0	.....	.....
Pine River	85	11	46.8	2.57	0.5
Portage	84	15	49.0	2.14	T.
Port Washington	84	20	47.2	2.81	T.
Prairie du Chien	89	11	51.2	4.50	
Prentice	87	8	45.8	2.39	4.0
Racine	87	22	50.7	3.43	T.
Sheboygan	84	21	49.6	2.91	T.
Spooner	80	8	41.3	3.07	5.0
Stanley	83	9	44.6	2.71	2.1
Stevens Point	84	9	45.8	1.58	.....
Sturgeon Bay Canal	83	14	47.0	5.08	T.
Tomahawk	85	9	44.7	1.85	2.0
Valley Junction	84	11	46.6	3.18	T.
Viroqua	80	19	47.2	3.92	T.
Watertown	81	15	46.8	3.08	T.
Waukesha	.....	.....	.....	3.19	T.
Waupaca	83	11	46.8	1.92	
Wausau	81	12	45.4	1.88	3.8
Whitehall	83	9	45.0	2.09	1.5
Wyoming.					
Alcova	79	9	42.6	T.	T.

TABLE II.—*Climatological record of cooperative observers. Late reports for September*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Wyoming—Cont'd.	°	°	°	*Ins.*	*Ins.*
Barnum	.....	.....	.....	0.89	.....
Bedford	75	3	37.2	0.99	8.6
Border	76	— 1	35.8	0.68	.....
Buffalo	84	— 2	39.6	0.68	4.5
Cambria	80	10	42.6	0.90	4.0
Chugwater	84	6	40.5	0.66	5.0
Clark	.....	.....	.....	0.95	3.5
Daniel	70	— 5	32.4	0.50	4.0
Elk Mountain	.....	.....	.....	0.67	7.8
Embar	72	— 1	38.9	1.20	.....
Evanston	73	— 3	37.6	0.30	2.5
Fayette	82	— 4	36.8	.....	.....
Fort Laramie	87	12	42.8	1.52	.....
Fort Washakie	81	— 2	38.8	1.25	8.5
Gillette	82	3	43.0	2.24	6.5
Granite Canyon	77	7	38.1	1.89	17.5
Granite Springs	.....	.....	.....	1.80	.....
Green River	80	6	39.1	0.53	T.
Griggs	81	— 3	41.0	1.06	9.6
Hatton	.....	.....	.....	1.71	12.0
Jackson	75	1	36.0	0.65	2.0
Kirtley	81	4	39.6	0.94	2.0
Laramie	73	— 8	37.4	0.53	3.2
Leo	75	6	38.0	0.41	3.5
Little Medicine	78	1	35.9	0.15	2.5
Lolabama Ranch	72	— 1	35.0	1.31	5.0
Lusk	90	5	39.3	0.20	2.0
Moore	78	13	41.7	0.76	2.2
Pathfinder	.....	.....	.....	0.30	4.0
Phillips	85	9	42.5	1.27	.....
Pine Bluff	88	5	43.5	0.90	9.0
Rambler	62	— 1	29.6	2.05	20.5
Sheridan	85	2	42.4	1.61	1.5
South Pass City	71	— 9	32.2	1.30	13.0
Thayne	78	7	37.9	0.77	4.1
Wells	68	1	31.0	0.36	2.6
Wolf	84	5	44.2	1.80	18.0
Yellowstone Pk. (Foun'n)	74	1	32.3	0.51	.....
Yellowstone Pk. (Norris)	72	5	35.4	1.45	12.0
Yellowstone Pk (Riversde)	71	— 6	31.8	1.13	.....
Yellowstone Pk (Snake R)	78	0	33.3	.....	.....
Yellowstone Pk. (Soda B.)	71	— 4	32.7	0.74	13.0
Yellowstone Pk. (Thumb)	67	— 5	30.4	1.63	.....
Yellowstone Pk. (Up. B.)	67	— 4	30.2	2.19	21.9
Porto Rico.					
Adjuntas	90	55	73.0	19.20	
Agua Buenos	.....	.....	.....	19.65	
Aguirre	96	69	81.6	10.44	
Arecibo	91	63	76.6	6.83	
Barros	87	58	73.6	9.96	
Bayamon	94	66	78.3	9.45	
Caguas	92	62	77.2	6.08	
Canovanas	91	72	80.2	9.82	
Cayey	87	68	78.8	11.11	
Cidra	89	60	75.2	14.36	
Corozal	92	56	78.0	13.23	
Fajardo	93	69	80.8	13.43	
Hacienda Coloso	91	67	79.1	8.56	
Hacienda Josefa	.....	.....	.....	7.86	
Humacao	90	75	83.3	14.57	
Ingenio	.....	.....	.....	15.82	
Isabela	92	69	79.8	5.94	
Juana Diaz	94	69	81.4	8.94	
La Carmelita	88	65	75.0	21.29	
Lares	93	60	76.6	11.84	
Las Cruces	87	62	72.8	20.98	
Las Marias	89	63	76.4	17.54	
Manati	95	66	79.4	10.57	
Maunabo	94	69	81.7	18.33	
Mayaguez	93	67	79.7	9.85	
Morovis	96	60	77.8	15.86	
Ponce	90	70	79.8	4.70	
Rio Blanco	90[e]	68[e]	78.4[e]	12.31	
Rio Piedras	.....	.....	.....	10.61	
San German	92	65	79.6	15.59	
San Lorenzo	94	64	77.6	14.02	
San Salvador	87	63	74.6	12.30	
Santa Isabel	92	67	79.3	9.01	
Vega Baja	96	70	81.9	13.69	
Vieques	99	68	81.6	11.96	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.	
New Brunswick.	°	°	°	*Ins.*	*Ins.*	
St. John	65	29	45.6	1.19		
West Indies.						
Basseterre, St. Kitts	88	72	80.6	3.79		
Bridgetown, Bar	89	73	80.8	3.50		
Camaguey, Cuba	92	66	79.0	0.91		
Cienfuegos, Cuba	90	70	80.2	3.32		
Colon, Panama	91	70	78.7	13.06		
Curacao, W. I.	92	73	83.3	1.12		
Kingston, Jamaica	90	67	78.6	20.89		
Port of Spain, Trinidad	90	68	78.8	5.31		
Roseau	92	72	82.0	7.55		
Santiago de Cuba	92	69	80.6	9.44		
Santo Domingo	90	68	78.4	14.35		

Late reports for September, 1905.

	°	°	°	*Ins.*	*Ins.*
Alaska.					
Coal Harbor	66	35	48.8	2.95	
Copper Center	67	12	38.9	1.94	T.
Fort Egbert	75	20	42.6	3.38	.....
Holy Cross Mission	58	17	38.4	1.38	T.
Kenai	72	13	43.6	0.78	
Loring	70	35	50.0	14.07	
North Fork	68	15	38.3	1.86	6.0
Rampart	60	13	35.1	1.70	7.8
Skagway	64	32	48.6	2.67	
Sunrise	65	20	42.2	1.86	
Teikhill	66	15	38.5	1.41	2.5
Tyoonok	79	22	47.6	0.92	
Udakta	61	33	46.1	3.46	
Wood Island	55[3]	32[d]	43.6[d]	1.80	
Arkansas.					
Jonesboro	.....	50	.....	1.80	
California.					
Claremont	104	45	71.6	0.02	
Kernville	.....	.....	.....	0.10	
Summit	74	35	59.4	0.50	5.0
Maine.					
Bar Harbor	77	32	56.3	7.79	
Fort Fairfield	83	27	55.0	1.69	
Houlton	75	22	54.0	1.80	
Michigan.					
Calumet	85	36	59.1	5.86	
Minnesota.					
Floodwood	84	28	59.8	3.00	
Montana.					
Anaconda	89	29	56.8	0.43	T.
North Carolina.					
Sloan	94	47	74.2	6.67	
North Dakota.					
Sentinel Butte	.....	.....	.....	1.23	
Oregon.					
Riverside	95	25	61.4	0.05	
Pennsylvania.					
East Mauch Chunk	89	32	65.0	6.31	
South Carolina.					
Allendale	96	63	78.4	0.78	
Batesburg	98	58	76.8	0.92	
Blackville	98	60	78.8	0.21	
Greenwood	93	58	75.2	0.48	
South Dakota.					
Wolsey	.....	.....	.....	1.02	
Tennessee.					
Brownsville	90	.....	.....	0.42	
Texas.					
Bonham	98	54	77.6	1.14	
Hearne	97	62	81.0	0.00	
Hondo	98	62[c]	81.8[c]	5.82	
Kaufman	99	59[c]	80.1	3.92	
Utah.					
Thistle	.....	.....	.....	3.18	
Washington.					
Clearwater	85	39	57.2	11.66	
Southbend	.....	.....	.....	5.90	
Wisconsin.					
Grantsburg	84	33	61.8	7.73	
Valley Junction	88	33	64.4	4.34	
Porto Rico.					
Rio Blanco	90[e]	66[f]	79.0[f]	12.57	

EXPLANATION OF SIGNS.

[e] Extremes of temperature from observed readings of dry thermometer.

A numeral following the name of a station indicates the hours of observation from which the mean temperature was obtained, thus:

[1] Mean of 7 a. m. + 2 p. m. + 9 p. m. + 9 p. m. + 4.
[2] Mean of 8 a. m. + 8 p. m. + 2.
[3] Mean of 7 a. m. + 7 p. m. + 2.
[4] Mean of 6 a. m. + 6 p. m. + 2.
[5] Mean of 7 a. m. + 2 p. m. + 2.
[6] Mean of readings at various hours reduced to true daily mean by special tables.

The absence of a numeral indicates that the mean temperature has been obtained from daily readings of the maximum and minimum thermometers.

An italic letter following the name of a station, as "Livingston *a*," "Livingston *b*," indicates that two or more observers, as the case may be, are reporting from the same station. A small roman letter following the name of a station, or in figure columns, indicates the number of days missing from the record; for instance, "[a]" denotes 14 days missing.

No note is made of breaks in the continuity of temperature records when the same do not exceed two days. All known breaks of whatever duration, in the precipitation record receive appropriate notice.

CORRECTIONS.

February, 1905, (page 69), Idaho, Soldier, the values published are those for January, 1905.

September, 1905, New Hampshire, Bartlett, make precipitation 6.47 instead of 6.83.

Under "Late reports for August, 1905", page 424, the values for Mohave, Cal., are those for September, 1905; also on same page, under New Mexico, cut out all values for Arabela.

The following change has been made in names of stations: Virginia, Greenwich changed to Nokesville (near).

TABLE III.—*Resultant winds from observations at 8 a. m. and 8 p. m., daily, during the month of October, 1905.*

Stations.	Component direction from—				Resultant.	
	N.	S.	E.	W.	Direction from—	Duration.
New England.	*Hours.*	*Hours.*	*Hours.*	*Hours.*	°	*Hours.*
Eastport, Me	15	18	9	32	s. 83 w.	23
Portland, Me	15	24	10	26	s. 61 w.	18
Concord, N. H.†	11	6	8	12	n. 39 w.	6
Northfield, Vt	17	32	8	18	s. 34 w.	18
Boston, Mass	16	17	10	35	s. 88 w.	25
Nantucket, Mass	16	22	15	25	s. 59 w.	12
Block Island, R. I	20	21	11	25	s. 86 w.	14
Providence, R. I	21	10	9	34	n. 66 w.	27
Hartford, Conn	21	27	7	18	s. 61 w.	12
New Haven, Conn	24	18	10	23	n. 65 w.	14
Middle Atlantic States.						
Albany, N. Y	15	32	6	16	s. 30 w.	20
Binghamton, N. Y.†	11	4	12	10	n. 16 e.	7
New York, N. Y	15	15	17	25	w.	8
Harrisburg, Pa	15	13	19	26	n. 74 w.	7
Philadelphia, Pa	20	19	18	24	n. 80 w.	6
Scranton, Pa	21	25	15	19	s. 45 w.	6
Atlantic City, N. J	21	16	14	27	n. 69 w.	14
Cape May, N. J	20	17	15	24	n. 72 w.	10
Baltimore, Md	18	17	12	25	n. 86 w.	13
Washington, D. C	21	23	12	19	s. 74 w.	7
Lynchburg, Va	17	18	24	17	s. 82 w.	7
Mount Weather, Va	16	17	13	27	s. 86 w.	14
Norfolk, Va	25	21	18	16	n. 27 e.	4
Richmond, Va	22	23	11	16	s. 79 w.	5
Wytheville, Va	17	9	21	30	n. 48 w.	12
South Atlantic States.						
Asheville, N. C	18	26	21	13	s. 45 e.	11
Charlotte, N. C	26	20	26	8	n. 72 e.	19
Hatteras, N. C	27	13	21	18	n. 12 e.	14
Raleigh, N. C	30	18	11	15	n. 18 w.	13
Wilmington, N. C	32	15	22	9	n. 38 e.	22
Charleston, S. C	28	12	25	3	n. 54 e.	27
Columbia, S. C	27	13	32	3	n. 64 e.	32
Augusta, Ga	27	9	30	9	n. 49 e.	28
Savannah, Ga	32	10	25	3	n. 45 e.	31
Jacksonville, Fla	39	5	26	5	n. 32 e.	40
Florida Peninsula.						
Jupiter, Fla	29	9	40	4	n. 73 e.	38
Key West, Fla	31	3	38	2	n. 52 e.	46
Tampa, Fla	41	2	35	4	n. 39 e.	50
Eastern Gulf States.						
Atlanta, Ga	29	8	29	13	n. 37 e.	26
Macon, Ga.†	17	5	11	4	n. 30 e.	14
Pensacola, Fla.†	18	2	16	3	n. 39 e.	21
Birmingham, Ala.†	13	6	17	3	n. 52 e.	18
Mobile, Ala	32	14	23	7	n. 42 e.	24
Montgomery, Ala	28	8	30	9	n. 46 e.	29
Meridian, Miss.†	14	4	14	4	n. 45 e.	14
Vicksburg, Miss	24	12	33	8	n. 64 e.	28
New Orleans, La	27	9	32	4	n. 57 e.	33
Western Gulf States.						
Shreveport, La	27	12	38	10	n. 62 e.	32
Fort Smith, Ark	17	9	35	11	n. 72 e.	25
Little Rock, Ark	28	14	19	15	n. 16 e.	15
Corpus Christi, Tex	28	16	28	3	n. 64 e.	28
Fort Worth, Tex	27	17	20	11	n. 42 e.	14
Galveston, Tex	27	17	29	4	n. 68 e.	27
Palestine, Tex	29	17	27	2	n. 64 e.	28
San Antonio, Tex	32	14	28	4	n. 53 e.	30
Taylor, Tex.†	17	8	4	4	n.	9
Ohio Valley and Tennessee.						
Chattanooga, Tenn	23	18	18	16	n. 22 e.	5
Knoxville, Tenn	31	10	17	19	n. 5 w.	21
Memphis, Tenn	24	20	22	10	n. 72 e.	13
Nashville, Tenn	24	18	19	15	n. 34 e.	7
Lexington, Ky.†	8	12	9	7	s. 27 e.	4
Louisville, Ky	26	20	11	16	n. 40 w.	8
Evansville, Ind.†	12	11	9	6	n 72 e.	3
Indianapolis, Ind	21	23	12	17	s. 68 w.	5
Cincinnati, Ohio	20	18	17	21	n. 63 w.	4
Columbus, Ohio	14	27	18	17	s. 4 e.	13
Pittsburg, Pa	22	17	14	24	n. 63 w.	11
Parkersburg, W. Va	20	23	13	19	s. 63 w.	7
Elkins, W. Va	19	19	9	29	w.	20
Lower Lake Region.						
Buffalo, N. Y	10	21	15	28	s. 50 w.	17
Oswego, N. Y	9	31	12	22	s. 24 w.	24
Rochester, N. Y	6	26	10	34	s. 50 w.	31
Syracuse, N. Y	3	35	11	22	s. 19 w.	34
Erie, Pa	8	36	10	23	s. 25 w.	31
Cleveland, Ohio	10	36	17	14	s. 7 e.	26
Sandusky, Ohio†	2	18	3	14	s. 34 w.	19
Toledo, Ohio	10	25	10	25	s. 45 w.	21
Detroit, Mich	14	24	11	27	s. 56 w.	19
Upper Lake Region.						
Alpena, Mich	15	22	6	35	s. 76 w.	30
Escanaba, Mich	20	21	4	32	s. 88 w.	28
Grand Rapids, Mich	16	22	15	24	s. 56 w.	11
Houghton, Mich.†	8	8	8	12	w.	4
Marquette, Mich	10	22	5	36	s. 69 w.	33
Port Huron, Mich	9	28	12	26	s. 36 w.	24
Sault Ste. Marie, Mich	16	20	19	23	s. 45 w.	6
Chicago, Ill	14	26	10	26	s. 53 w.	20
Milwaukee, Wis	14	21	9	29	s. 71 w.	21
Green Bay, Wis	10	32	13	24	s. 26 w.	25
Duluth, Minn	18	9	11	36	n. 70 w.	27

Stations.	Component direction from—				Resultant.	
	N.	S.	E.	W.	Direction from—	Duration.
North Dakota.	*Hours.*	*Hours.*	*Hours.*	*Hours.*	°	*Hours.*
Moorhead, Minn	25	20	9	24	n. 72 w.	16
Bismarck, N. Dak	27	12	14	29	n. 45 w.	21
Devils Lake, N. Dak	20	15	8	32	n. 78 w.	24
Williston, N. Dak.	21	16	12	29	n. 74 w.	18
Upper Mississippi Valley.						
Minneapolis, Minn.*	10	12	5	10	s. 68 w.	5
St. Paul, Minn	22	22	7	24	w.	17
La Crosse, Wis.†	8	15	1	9	s. 49 w.	11
Madison, Wis	10	26	9	29	s. 51 w.	26
Charles City, Iowa	16	25	12	22	s. 48 w.	14
Davenport, Iowa	18	12	12	33	n. 74 w.	22
Des Moines, Iowa	17	22	10	26	s. 73 w.	17
Dubuque, Iowa	14	22	6	30	s. 60 w.	16
Keokuk, Iowa	15	23	17	25	s. 45 w.	11
Cairo, Ill	27	21	19	8	n. 61 e.	12
La Salle, Ill.†	8	6	9	16	n. 74 w.	7
Peoria, Ill	9	11	7	11	s. 63 w.	4
Springfield, Ill	16	23	15	21	s. 41 w.	9
Hannibal, Mo.†	11	10	7	13	n. 80 w.	6
St. Louis, Mo	20	26	18	11	s. 49 e.	9
Missouri Valley.						
Columbia, Mo.*	7	15	11	8	s. 21 e.	8
Kansas City, Mo	19	24	21	15	s. 50 e.	8
Springfield, Mo	18	25	24	8	s. 66 e.	18
Topeka, Kans.*	6	11	9	7	s. 22 e.	5
Lincoln, Nebr	20	29	9	14	s. 29 w.	10
Omaha, Nebr	20	27	8	18	s. 55 w.	12
Valentine, Nebr	26	9	12	27	n. 42 w.	23
Sioux City, Iowa†	11	11	9	10	w.	1
Pierre, S. Dak	24	15	22	19	n. 18 e.	10
Huron, S. Dak	21	17	17	23	n. 56 w.	7
Yankton, S. Dak.†	10	8	6	12	n. 72 w.	6
Northern Slope.						
Havre, Mont.	15	15	9	38	w.	29
Miles City, Mont	18	21	18	18	s.	3
Helena, Mont	12	20	2	44	s. 79 w.	43
Kalispell, Mont	14	23	2	36	s. 75 w.	35
Rapid City, S. Dak	20	9	12	33	n. 62 w.	24
Cheyenne, Wyo	26	15	6	29	n. 64 w.	26
Lander, Wyo	22	20	11	21	n. 79 w.	10
Yellowstone Park, Wyo	16	30	6	26	s. 55 w.	24
North Platte, Nebr	19	21	10	24	s. 82 w.	14
Middle Slope.						
Denver, Colo	28	22	12	10	n. 18 e.	6
Pueblo, Colo	25	9	26	17	n. 29 e.	18
Concordia, Kans	17	28	15	9	s. 29 e.	12
Dodge, Kans	20	22	18	12	s. 72 e.	6
Wichita, Kans	22	29	17	8	s. 52 e.	11
Oklahoma, Okla	22	24	18	9	s. 77 e.	9
Southern Slope.						
Abilene, Tex	15	29	18	13	s. 20 e.	15
Amarillo, Tex	19	30	16	9	s. 32 e.	13
Roswell, N. Mex.	15	27	20	13	s. 30 e.	14
Southern Plateau.						
El Paso, Tex	14	12	30	21	n. 77 e.	9
Santa Fe, N. Mex	22	21	24	15	n. 84 e.	9
Flagstaff Ariz	29	16	20	19	n. 14 e.	4
Phoenix, Ariz	13	6	30	22	n. 49 e.	11
Yuma, Ariz	29	12	15	22	n. 22 w.	18
Independence, Cal	23	18	15	25	n. 63 w.	11
Middle Plateau.						
Carson City, Nev	20	19	18	31	n. 86 w.	13
Winnemucca, Nev	29	12	22	22	n.	17
Modena, Utah	7	13	20	30	s. 59 w.	12
Salt Lake City, Utah	18	15	19	17	n. 34 e.	4
Durango, Colo	27	15	2	33	n. 69 w.	33
Grand Junction, Colo	23	10	21	21	n.	13
Northern Plateau.						
Baker City, Oreg						
Boise, Idaho	18	16	16	27	n. 80 w.	11
Lewiston, Idaho†	4	5	18	7	s. 85 e.	11
Pocatello, Idaho	4	29	19	22	s. 7 w.	25
Spokane, Wash	17	26	22	16	s. 34 e.	11
Walla Walla, Wash	7	41	10	20	s. 16 w.	35
North Pacific Coast Region.						
North Head, Wash	23	12	20	17	n. 15 e.	11
Port Crescent, Wash.*	2	10	18	8	s. 51 e.	13
Seattle, Wash	22	16	24	9	n. 68 e.	16
Tacoma, Wash	20	26	12	17	s. 40 w.	8
Tatoosh Island, Wash	6	13	40	12	s. 76 e.	29
Portland, Oreg	18	17	13	30	n. 87 w.	17
Roseburg, Oreg	21	16	15	25	n. 63 w.	11
Middle Pacific Coast Region.						
Eureka, Cal	27	16	16	17	n. 5 w.	11
Mount Tamalpais, Cal	33	5	10	30	n. 36 w.	34
Red Bluff, Cal	43	12	7	5	n. 4 e.	31
Sacramento, Cal	28	18	17	13	n. 22 e.	11
San Francisco, Cal	11	8	6	41	n. 85 w.	35
South Pacific Coast Region.						
Fresno, Cal	38	4	4	34	n. 42 w.	45
Los Angeles, Cal	13	10	17	33	n. 79 w.	16
San Diego, Cal	27	12	10	30	n. 53 w.	25
San Luis Obispo, Cal	38	6	10	24	n. 24 w.	35
West Indies						
Grand Turk, W. I	2	8	21	6	s. 68 e.	16
San Juan, Porto Rico	2	36	34	5	s. 41 e.	45
Hamilton, Bermuda	23	18	21	5	n. 73 e.	17

* From observations at 8 p. m. only. † From observations at 8 a. m. only.

TABLE IV.—*Accumulated amounts of precipitation for each 5 minutes, for storms in which the rate of fall equaled or exceeded 0.25 in any 5 minutes, or 0.75 in 1 hour during October, 1905, at all stations furnished with self-registering gages.*

Stations.	Date.	Total duration. From—	Total duration. To—	Total amount of precipitation.	Excessive rate. Began—	Excessive rate. Ended—	Amount before excessive began.	Depths of precipitation (in inches) during periods of time indicated. 5 min.	10 min.	15 min.	20 min.	25 min.	30 min.	35 min.	40 min.	45 min.	50 min.	60 min.	80 min.	100 min.	120 min.
	1	2	3	4	5	6	7														
Albany, N. Y.	11-12			1.19														0.58			
Alpena, Mich.	19-20			0.59														0.19			
Amarillo, Tex.	24			0.15														0.08			
Asheville, N. C.	10-11			0.98														0.39			
Atlanta, Ga.	10			1.15														0.24			
Atlantic City, N. J.	3			0.16														0.15			
Augusta, Ga.	3			0.39														0.21			
Baltimore, Md.	11			0.88														0.40			
Binghamton, N. Y.	11			1.60														0.51			
Birmingham, Ala.	15			0.47														0.25			
Bismarck, N. Dak.	29			0.23														*			
Block Island, R. I.	19-20			0.98														0.73			
Boise, Idaho.	7			0.40									0.24								
Boston, Mass.	20			0.55														0.13			
Buffalo, N. Y.	18			1.40														*			
Cairo, Ill.	18			0.86														0.47			
Charles City, Iowa.	13-14			1.17														0.38			
Charleston, S. C.	25-26	3:50 p. m.	7:30 a. m.	2.09	4:04 a. m.	4:49 a. m.	0.23	0.06	0.33	0.40	0.52	0.56	0.75	0.91	1.10	1.23					
Charlotte, N. C.	29			0.20														0.09			
Chattanooga, Tenn.	15			0.64														0.40			
Cheyenne, Wyo.	13-14			0.64														*			
Chicago, Ill.	17			0.48						0.35											
Cincinnati, Ohio.	19	2:50 a. m.	1:30 p. m.	1.66	10:26 a. m.	10:41 a. m.	0.78	0.30	0.50	0.64											
Cleveland, Ohio.	2			0.64														0.24			
Columbia, Mo.	16	1:24 p. m.	6:09 p. m.	1.49	5:11 p. m.	5:51 p. m.	0.41	0.10	0.13	0.15	0.22	0.48	0.88	0.96	1.07						
Do.	17-18	2:23 p. m.	10:20 a. m.	2.29	8:11 p. m.	8:45 p. m.	0.44	0.14	0.19	0.22	0.23	0.44	0.58	0.68							
Columbia, S. C.	3	1:34 p. m.	7:30 p. m.	0.73	3:30 p. m.	3:50 p. m.	0.06	0.18	0.32	0.37	0.43										
Columbus, Ohio.	18			0.94						0.38											
Concord, N. H.	11-12			0.63														0.17			
Corpus Christi, Tex.	20			0.10														0.08			
Davenport, Iowa.	17			2.32								0.48									
Denver, Colo.	29-30			1.02														*			
Des Moines, Iowa.	16-17			1.56														0.49			
Detroit, Mich.	18			0.72														0.16			
Dodge, Kans.	24			0.75														0.34			
Dubuque, Iowa.	16-17			2.25														0.59			
Duluth, Minn.	14-15			1.11														0.27			
Eastport, Me.	20			0.25														0.11			
Elkins, W. Va.	10-11			1.00														0.12			
Erie, Pa.	11-12			1.64														0.25			
Escanaba, Mich.	19-20			1.68														*			
Evansville, Ind.	17	1:44 p. m.	3:10 p. m.	0.78	2:28 p. m.	3:00 p. m.	T.	0.18	0.28	0.28	0.29	0.49	0.76								
Do.	19	4:45 p. m.	5:55 p. m.	0.60	4:47 p. m.	5:07 p. m.	T.	0.14	0.34	0.52	0.58										
Fort Smith, Ark.	1-2	7:55 p. m.	1:50 p. m.	3.42	6:07 a. m.	6:57 a. m.	0.82	0.07	0.13	0.22	0.28	0.32	0.38	0.45	0.51	0.56	0.59				
					6:57 a. m.	7:47 a. m.		0.65	0.78	0.95	1.19	1.28	1.32	1.39	1.45	1.47	1.50				
					7:47 a. m.	9:32 a. m.		1.55	1.62	1.67	1.69	1.71	1.72	1.73	1.78	1.84	1.90	2.02	2.23	2.37	
Fort Worth, Tex.	2	12:10 a. m.	5:55 a. m.	1.35	3:30 a. m.	4:00 a. m.	0.48	0.05	0.11	0.19	0.39	0.62	0.72								
Do.	18	4:15 p. m.	5:00 p. m.	0.55	4:20 p. m.	4:29 p. m.	0.01	0.21	0.50												
Do.	24	4:15 a. m.	9:45 a. m.	1.25	6:25 a. m.	7:31 a. m.	0.02	0.16	0.19	0.20	0.20	0.21	0.34	0.41	0.42	0.58	0.72	0.82			
Galveston, Tex.	5			0.57					0.51												
Grand Rapids, Mich.	17-18	7:25 p. m.	6:20 a. m.	1.78	8:35 p. m.	9:17 p. m.	0.31	0.08	0.14	0.19	0.25	0.47	0.55	0.66	0.81	0.87					
Green Bay, Wis.	17			0.72														0.30			
Hannibal, Mo.	19	D. N.	D. N.	0.60	4:12 a. m.	4:24 a. m.	0.04	0.25	0.53	0.56											
Harrisburg, Pa.	2	8:13 p. m.	D. N.	0.65	8:23 p. m.	8:46 p. m.	0.03	0.05	0.18	0.37	0.49	0.54									
Hartford, Conn.	19-20			1.21														0.31			
Hatteras, N. C.	3	7:15 p. m.	11:40 p. m.	0.74	7:27 p. m.	7:36 p. m.	0.01	0.26	0.44												
Huron, S. Dak.	14			0.76														0.15			
Indianapolis, Ind.	18			1.61														0.62			
Iola, Kans.	24-25			0.71														0.26			
Jacksonville, Fla.	16	10:05 a. m.	11:35 a. m.	0.69	10:08 a. m.	10:28 a. m.	0.01	0.19	0.34	0.43	0.49										
Jupiter, Fla.	28	5:10 p. m.	8:05 p. m.	0.74	5:57 p. m.	6:17 p. m.	0.02	0.32	0.50	0.63											
Kansas City, Mo.	16	1:30 p. m.	2:35 p. m.	0.54	1:49 p. m.	2:18 p. m.	0.02	0.08	0.19	0.22	0.24	0.39	0.50								
Key West, Fla.	1	9:50 a. m.	11:20 a. m.	1.09	10:11 a. m.	10:41 a. m.	0.01	0.09	0.19	0.32	0.51	0.90									
Do.	5	12:20 p. m.	12:58 p. m.	0.62	12:21 p. m.	12:41 p. m.	0.01	0.23	0.39	0.48	0.56										
Knoxville, Tenn.	20	D. N.	D. N.	0.76	1:50 a. m.	2:15 a. m.	0.01	0.14	0.27	0.34	0.45	0.61									
La Crosse, Wis.	14			0.67														0.21			
La Salle, Ill.	17			0.46														0.42			
Lexington, Ky.	24-26			2.27														0.45			
Lincoln, Nebr.	16-17			0.96														*			
Little Rock, Ark.	18-19			1.90														0.51			
Los Angeles, Cal.	21-22			0.08														0.03			
Louisville, Ky.	19			1.40														0.66			
Lynchburg, Va.	10-11			1.19														0.29			
Macon, Ga.	3			0.61														0.26			
Madison, Wis.	17			1.53														0.48			
Memphis, Tenn.	18	11:25 a. m.	6:20 p. m.	2.43	1:09 p. m.	2:01 p. m.	0.21	0.09	0.12	0.16	0.21	0.23	0.27	0.34	0.43	0.58	0.67	0.75			
					3:04 p. m.	3:50 p. m.	1.10	0.12	0.42	0.51	0.56	0.61	0.68	0.73	0.78	0.88					
Meridian, Miss.	25			1.18														0.65			
Milwaukee, Wis.	19			0.95														0.65			
Minneapolis, Minn.	14			0.84														0.36			
Montgomery, Ala.	9-10			1.65														0.57			
Mount Weather, Va.	10-11			1.52														0.38			
Nantucket, Mass.	19-20			1.50														0.64			
Nashville, Tenn.	10			1.00														0.32			
New Haven, Conn.	19-20			1.39														0.35			
New Orleans, La.	8-9			4.49														0.52			
New York, N. Y.	19-20			1.60														0.36			
Norfolk, Va.	25-26			1.12														0.36			
Northfield, Vt.	11-12			0.96														0.20			
North Head, Wash.	14			0.54														0.21			
Oklahoma, Okla.	24			0.50						0.50											
Omaha, Nebr.	16-17	10:10 p. m.	10:30 a. m.	1.94	10:25 p. m.	11:15 p. m.	0.02	0.05	0.05	0.06	0.24	0.36	0.36	0.36	0.36	0.49	0.70				
					11:15 p. m.	12:46 a. m.		0.83	0.86	0.86	0.86	0.93	1.15	1.17	1.23	1.24	1.25	1.42	1.55	1.74	
Palestine, Tex.	24	10:31 a. m.	2:10 p. m.	1.25	11:43 a. m.	12:43 p. m.	0.12	0.16	0.24	0.27	0.36	0.54	0.61	0.65	0.77	0.80	0.91	1.01			
Parkersburg, W. Va.	1			2.26														0.48			
Pensacola, Fla.	9	1:55 a. m.	6:20 p. m.	2.46	1:37 p. m.	2:07 p. m.	0.94	0.11	0.38	0.70	0.89	0.92	1.07								
Do.	15	5:00 a. m.	1:35 p. m.	2.01	10:34 a. m.	11:31 a. m.	0.94	0.10	0.15	0.21	0.29	0.30	0.31	0.36	0.41	0.54	0.70	0.88			
Peoria, Ill.	16			0.77														0.39			
Philadelphia, Pa.	19-20	9:00 p. m.	12:15 a. m.	1.08	9:09 p. m.	10:04 p. m.	0.02	0.16	0.37	0.45	0.47	0.50	0.54	0.57	0.64	0.72	0.79	0.84			
Pittsburg, Pa.	2			0.73														0.61			

TABLE IV.—*Accumulated amounts of precipitation for each 5 minutes, etc.*—Continued.

Stations.	Date.	Total duration. From—	Total duration. To—	Total amount of precipitation.	Excessive rate. Began—	Excessive rate. Ended—	Amount before excessive began.	Depths of precipitation (in inches) during periods of time indicated. 5 min.	10 min.	15 min.	20 min.	25 min.	30 min.	35 min.	40 min.	45 min.	50 min.	60 min.	80 min.	100 min.	120 min.
	1	2	3	4	5	6	7														
Portland, Me	12			0.59														0.17			
Portland, Oreg	14–15			0.46														0.25			
Pueblo, Colo	29–31			0.68														*			
Raleigh, N. C	20			0.32					0.32												
Richmond, Va	11			0.49														0.20			
Rochester, N. Y	2			0.77														0.60			
Sacramento, Cal	†																				
St. Louis, Mo	17–18	11:00 p. m.	7:28 a. m.	2.69	11:25 p. m.	1:02 a. m.	0.01	0.09	0.20	0.23	0.27	0.36	0.42	0.55	0.61	0.68	0.72	0.88	1.40	1.51	
St. Paul, Minn	14–15			1.05														0.18			
Salt Lake City, Utah	18			0.14														*			
San Antonio, Tex	19–20			0.64														0.37			
San Diego, Cal	22			0.17														0.11			
Sandusky, Ohio	19			0.43														0.30			
San Francisco, Cal	7			T.																	
Savannah, Ga	4	D. N.	D. N.	1.20	1:24 a. m.	1:54 a. m.	0.04	0.21	0.49	0.67	0.72	0.78	0.83								
Do	26	D. N.	7:18 a. m.	1.15	5:02 a. m.	5:32 a. m.	0.30	0.06	0.17	0.24	0.37	0.52	0.61								
Scranton, Pa	11–12			1.45														0.35			
Seattle, Wash	2			1.32														0.30			
Shreveport, La	24	12:45 p. m.	7:35 p. m.	2.85	3:09 p. m.	3:27 p. m.	0.40	0.08	0.21	0.37								1.27	1.48		
					5:33 p. m.	6:45 p. m.	1.34	0.07	0.25	0.43	0.63	0.69	0.72	0.86	0.90	0.95	1.04				
Spokane, Wash	7			0.80														0.17			
Springfield, Ill	19			0.63										0.50							
Springfield, Mo	24–25			1.68														0.45			
Syracuse, N. Y	2			0.58														0.41			
Tampa, Fla	7			0.24					0.24												
Taylor, Tex	19	9:58 a. m.	2:15 p. m.	1.41	10:20 a. m.	10:40 a. m.	0.03	0.16	0.29	0.38	0.47										
Toledo, Ohio	10–11			0.43														0.14			
Topeka, Kans	24			0.26														0.17			
Valentine, Nebr	8			0.48														*			
Vicksburg, Miss	14–15	9:30 p. m.	D. N.	3.01	10:02 p. m.	11:54 p. m.	0.15	0.08	0.17	0.27	0.34	0.45	0.51	0.54	0.57	0.70	0.82	1.09	2.13	2.46	2.68
Washington, D. C	11			1.10														0.57			
Wichita, Kans	24			0.60														0.20			
Williston, N. Dak	23			0.03																	
Wilmington, N. C	25–26			1.60														*			
Wytheville, Va	10–11			0.72														0.21			
Yankton, S. Dak	13–14			0.59														0.22			
Cienfuegos, Cuba	21	5:11 p. m.	6:41 p. m.	0.99	5:26 p. m.	6:33 p. m.	T.	0.12	0.17	0.22	0.24	0.27	0.42	0.54	0.59	0.66	0.68	0.87			
San Juan, Porto Rico	3	2:44 p. m.	6:00 p. m.	0.85	2:49 p. m.	3:10 p. m.	0.01	0.12	0.30	0.57	0.71										
Do	16	9:07 a. m.	10:28 a. m.	0.66	9:19 a. m.	9:46 a. m.	0.01	0.11	0.24	0.36	0.45	0.55	0.60								
Santiago de Cuba	1–2	1:45 a. m.	1.50 p. m.	7.33	2:28 a. m.	3:08 a. m.	0.04	0.13	0.28	0.49	0.74	0.95	1.29	1.46	1.55						
					8:31 a. m.	9:21 a. m.	2.91	0.12	0.22	0.28	0.41	0.52	0.61	0.68	0.78	0.91	1.08				
					9:21 a. m.	10:12 a. m.	.....	1.26	1.36	1.40	1.42	1.45	1.49	1.55	1.60	1.69	1.75				
Santo Domingo, S. D	3	11:25 a. m.	4:00 p. m.	2.66	11:57 a. m.	1:09 p. m.	0.01	0.33	0.77	1.21	1.43	1.64	1.79	1.87	1.95	2.02	2.07	2.20	2.49		
Do	5–6	10:24 a. m.	12:45 p. m.	4.94	4:21 p. m.	5:13 p. m.	0.59	0.11	0.31	0.35	0.38	0.64	0.76	0.78	0.89	0.90	1.01				
					3:02 a. m.	3:22 a. m.	2.29	0.40	0.73	1.14	1.26										
Do	31	3:50 p. m.	7:35 p. m.	1.40	3:55 p. m.	4:20 p. m.	0.01	0.06	0.34	0.59	0.90	1.04									

* Self-register not working † No precipitation.

TABLE V.—*Data furnished by the Canadian Meteorological Service, October, 1905.*

Stations.	Pressure, in inches. Actual, reduced to mean of 24 hours.	Pressure, in inches. Sea level, reduced to mean of 24 hours.	Pressure, in inches. Departure from normal.	Temperature. Mean.	Temperature. Departure from normal.	Temperature. Mean maximum.	Temperature. Mean minimum.	Precipitation. Total.	Precipitation. Departure from normal.	Precipitation. Total snowfall.
	Ins.	*Ins.*	*Ins.*	°	°	°	°	*Ins.*	*Ins.*	*Ins.*
St. Johns, N. F										
Sydney, C. B. I	29.94	29.98	+.02	46.7	+ 0.2	54.4	39.0	1.72	−2.97	
Halifax, N. S	29.94	30.05	+.05	47.4	+ 0.2	56.6	38.2	1.61	−3.94	
Grand Manan, N. B	29.99	30.04	+.04	48.2	+ 1.3	55.4	40.9	1.11	−3.60	
Yarmouth, N. S	30.00	30.07	+.05	46.8	− 0.8	53.8	39.8	1.48	−3.22	
Charlottetown, P. E. I	29.96	30.00	+.04	46.1	− 0.4	53.3	38.9	1.61	−3.39	
Chatham, N. B	29.98	30.00	+.04	45.7	+ 2.7	57.1	34.4	0.80	−3.06	
Father Point, Que	29.93	29.97	+.02	40.1	+ 0.3	46.7	33.4	2.66	−0.24	T.
Quebec, Que	29.69	30.02	+.02	42.6	+ 0.2	50.1	35.1	3.67	+0.52	2.3
Montreal, Que	29.83	30.04	+.03	46.1	+ 1.3	52.9	39.3	3.26	+0.13	0.6
Rockliffe, Ont	29.39	30.01	.00	43.4	+ 0.6	54.2	32.7	2.73	+0.30	1.5
Ottawa, Ont	29.68	30.00	−.01	46.5	+ 2.7	54.7	38.3	2.40	−0.15	0.8
Kingston, Ont	29.76	30.07	+.04	48.3	+ 1.3	56.9	39.8	3.87	+1.14	T.
Toronto, Ont	29.69	30.07	+.03	48.8	+ 2.2	57.4	40.2	3.48	+1.12	T.
White River, Ont	28.63	29.96	−.02	37.1	0.0	47.1	27.1	3.06	+0.71	7.6
Port Stanley, Ont	29.44	30.08	+.03	48.7	+ 0.9	58.3	39.2	2.22	−0.76	0.0
Saugeen, Ont	29.34	30.05	+.03	49.0	+ 2.9	57.2	40.9	5.00	+1.83	0.2
Parry Sound, Ont	29.29	30.04	+.03	46.6	+ 2.7	55.9	37.4	5.39	+1.47	0.2
Port Arthur, Ont	29.27	29.98	.00	40.3	+ 0.4	48.8	31.8	2.34	−0.22	0.7
Winnipeg, Man	29.15	30.00	+.02	38.1	− 1.0	48.0	28.1	1.03	−0.67	3.3
Minnedosa, Man	28.15	30.00	+.03	35.7	− 2.1	45.4	26.0	0.32	−0.88	0.5
Qu'Appelle, Assin	27.70	29.99	+.02	36.0	− 3.4	45.0	27.0	1.51	+0.41	5.7
Medicine Hat, Assin	27.72	30.02	+.05	42.4	− 2.4	53.9	30.9	0.13	−0.45	0.5
Swift Current, Assin	27.42	30.03	+.06	38.1	− 4.0	48.6	27.6	0.68	−0.20	3.4
Calgary, Alberta				37.4	− 2.7	50.4	24.4	0.31	−0.17	0.8
Banff, Alberta	25.40	30.09	+.14	32.6	− 6.7	40.9	24.4	1.66	+0.64	8.9
Edmonton, Alberta	27.66	29.99	+.06	36.3	− 4.8	46.1	26.6	0.64	−0.06	5.8
Prince Albert, Sask	28.35	29.94	−.03	32.3	− 4.8	40.3	24.2	1.80	+0.97	9.0
Battleford, Sask	28.26	30.04	+.07	34.9	− 4.7	44.9	24.9	0.82	+0.37	1.0
Kamloops, B. C	28.87	30.11	+.15	41.2	− 5.8	48.8	33.7	0.96	+0.35	0.0
Victoria, B. C	30.03	30.13	+.12	47.7	− 1.5	52.9	42.6	2.81	+0.44	0.0
Barkerville, B. C	25.71	30.09	+.15	31.0	− 8.7	37.5	24.6	3.62	+0.92	15.0
Hamilton, Bermuda	29.92	30.08	+0.6	73.6	+ 0.6	77.8	69.3	5.20	−1.51	
Dawson, Yukon										

TABLE VI.—*Heights of rivers referred to zeros of gages, October, 1905.*

Stations.	Distance to mouth of river.	Danger line on gage.	Highest water.		Lowest water.		Mean stage.	Monthly range.
			Height.	Date.	Height.	Date.		
Milk River.	*Miles.*	*Feet.*	*Feet.*		*Feet.*		*Feet.*	*Feet.*
Havre, Mont.	237	9	2.4	28-31	2.2	1-26	2.2	0.2
Musselshell River.								
Musselshell, Mont.	87	9	0.0	1-31	0.0	1-31	0.0	0.0
Yellowstone River.								
Billings, Mont.	330	8	0.7	{1, 2, 19/26-29}	0.5	4-14	0.6	0.2
Glendive, Mont.	78	17	2.4	2	1.4	10, 11	1.8	0.6
Cheyenne River.								
Rousseau, S. Dak	7	9	0.6	19, 20	0.0	{1-16, 25-/27, 29-31}	0.1	0.6
James River.								
Lamoure, N. Dak.	330	14	— 0.7	1-3	— 1.0	16-31	—0.9	0.3
Huron, S. Dak.	139	9	0.1	22, 28-31	— 0.3	2-5, 10, 11	—0.1	0.4
Republican River.								
Clay Center, Kans.	42	18	6.7	1-3	5.6	22	6.4	1.1
Smoky Hill River.								
Abilene, Kans.	45	22	1.3	1, 2	0.8	{15, 16, 18,/23, 24}	1.0	0.5
Kansas River.								
Manhattan, Kans.	116	18	3.7	1, 3	2.9	15	3.1	0.8
Topeka, Kans.	87	21	7.1	4	6.0	21	6.5	1.1
Missouri River.								
Townsend, Mont.	2,504	11	3.7	31	3.1	1, 2	3.4	0.6
Fort Benton, Mont.	2,285	12	1.2	24	0.0	1-9	0.2	1.2
Wolfpoint, Mont.	1,952	17	— 1.7	31	— 2.6	15	—2.2	0.9
Bismarck, N. Dak.	1,309	14	0.4	12	— 0.9	1-6	—0.5	1.3
Sioux City, Iowa	784	19	4.9	25-27	3.8	7-10	4.3	1.1
Blair, Nebr.	705	15	5.1	1, 2	4.0	13	4.5	1.1
Omaha, Nebr	669	18	4.8	3	3.4	15, 19	4.0	1.4
St. Joseph, Mo	481	10	2.8	1	0.8	14, 15	1.8	2.0
Kansas City, Mo.	388	21	9.2	1	6.6	16	7.6	2.6
Glasgow, Mo.	231	18	8.2	1	5.1	15	6.2	3.1
Boonville, Mo.	199	20	9.8	1	7.1	16, 17	8.3	2.7
Hermann, Mo.	103	24	14.0	18	7.7	17	10.8	6.3
Minnesota River.								
Mankato, Minn.	127	18	2.9	23, 24	2.4	13	2.7	0.5
St. Croix River.								
Stillwater, Minn.	23	11	7.7	25	5.2	17-19	6.4	2.5
Red Cedar River.								
Cedar Rapids, Iowa	77	14	3.6	19-25	3.0	10, 11	3.3	0.6
Iowa River.								
Iowa City, Iowa.	57	.....	2.4	18	— 1.3	12	—0.2	3.7
Des Moines River.								
Des Moines, Iowa.	205	19	4.6	18	3.0	11-13	3.5	1.6
Illinois River.								
La Salle, Ill	197	18	12.2	26, 27	11.3	14	11.7	0.9
Peoria, Ill.	135	14	8.5	1	7.6	15-17	8.0	0.9
Red Bank Creek.								
Brookville, Pa.	42	8	2.4	20	— 0.4	1, 2, 6-18	0.8	2.8
Clarion River.								
Clarion, Pa.	32	10	6.0	12	0.7	2	2.8	5.3
Conemaugh River.								
Johnstown, Pa.	64	7	5.3	20	0.9	9, 10	2.0	4.4
Kiskiminetas River								
Saltsburg, Pa.	22	6	3.7	21	— 1.0	1-3	0.6	4.7
Allegheny River.								
Warren, Pa.	177	14	2.8	23, 24	— 0.8	10, 11	0.9	3.6
Franklin, Pa	114	15	4.2	20, 24	0.3	1, 2	2.0	3.9
Parker, Pa.	73	20	5.0	21	0.6	1, 2	2.3	4.4
Freeport, Pa.	29	20	10.8	21	1.9	2	4.7	8.9
Springdale, Pa.	17	27	14.4	21	6.4	1, 2	8.9	8.0
Cheat River.								
Rowlesburg, W. Va.	36	14	4.0	27	0.1	3-5	1.6	3.9
Youghiogheny River.								
Confluence, Pa.	59	10	5.3	20	— 0.2	1, 2	1.0	5.5
West Newton, Pa.	15	23	6.7	21	0.0	1-3, 10-12	1.3	6.7
Monongahela River.								
Weston, W. Va.	161	18	2.4	20	— 1.2	10	—0.1	3.6
Fairmont, W. Va.	119	25	19.9	20	13.8	2-11	14.7	6.1
Greensboro, Pa.	81	18	14.1	20	5.9	6-10	7.3	8.2
Lock No. 4, Pa.	40	28	16.1	21	6.5	10	8.4	9.6
Beaver River.								
Ellwood Junction, Pa.	10	14	4.0	20	0.9	2	2.0	3.1
Muskingum River.								
Zanesville, Ohio	70	25	12.3	20	7.9	12	8.9	4.4
Beverly, Ohio.	20	25	10.8	20	4.3	12, 13	5.7	6.5
Little Kanawha River.								
Glenville, W. Va	77	20	9.0	20	— 1.6	1	1.4	10.6
Creston, W. Va.	38	20	8.8	20	0.0	2	3.4	8.8
New River.								
Radford, Va	155	14	0.4	{19-21,/28-30}	— 0.4	22-26	0.1	0.8
Hinton, W. Va.	95	14	2.2	13	1.3	2, 9, 10	1.5	0.9
Great Kanawha River.								
Charleston, W. Va.	58	30	7.7	17	6.5	6	7.1	1.2
Scioto River.								
Columbus, Ohio.	110	17	4.7	3	2.4	{13, 14,/17, 18}	2.9	2.3
Licking River.								
Falmouth, Ky.	30	25	6.0	26, 27	0.5	1-4	2.5	5.5
Miami River.								
Dayton, Ohio	77	18	2.8	20	1.2	17, 18	1.8	1.6
Kentucky River.								
Jackson, Ky.	287	24	6.3	21	5.0	{1, 2, 4-10,/15-19, 24,/26-30}	5.2	1.3
Beattyville, Ky	254	30	2.9	21	0.2	4-10	1.2	2.7
High Bridge, Ky.	117	17	13.0	26	8.9	5-10	10.0	4.1
Frankfort, Ky.	65	31	8.8	27	5.1	13	6.4	3.7
Wabash River.								
Mount Carmel, Ill	75	15	11.2	22	2.5	17, 18	5.3	8.7
Cumberland River.								
Burnside, Ky.	518	50	13.4	27	0.9	1, 2	3.3	12.5
Celina, Tenn.	383	45	13.2	29	0.9	1	4.7	12.3
Carthage, Tenn.	308	40	9.5	29	0.6	9	3.8	8.9
Nashville, Tenn.	193	40	13.6	31	7.2	9	9.5	6.4
Clarksville, Tenn.	126	42	16.8	30	2.1	2, 10, 11	6.8	14.7
Powell River.								
Tazewell, Tenn.	44	20	2.0	27	0.3	1-10	0.8	1.7
Clinch River.								
Speers Ferry, Va.	156	20	0.2	13	— 0.9	2	—0.5	1.1
Clinton, Tenn	52	25	5.7	28	2.6	1, 10	3.8	3.1
South Fork Holston River.								
Bluff City, Tenn.	35	15	0.6	12, 27	0.2	10	0.4	0.4
Holston River.								
Rogersville, Tenn.	103	14	1.7	13	1.4	8-11, 25	1.5	0.3
French Broad River.								
Asheville, N. C.	144	6	1.3	12	— 0.6	10	—0.4	1.9
Leadvale, Tenn.	70	15	— 1.0	{12-14,/27, 28}	— 3.0	5-10	—2.0	2.0
Little Tennessee River.								
McGhee, Tenn.	17	20	4.7	12	2.2	9	2.6	2.5
Hiwassee River.								
Charleston, Tenn	18	22	2.2	{12, 13,/16, 17, 20}	0.5	10	1.6	1.7
Tennessee River.								
Knoxville, Tenn.	635	29	1.7	13	0.4	1, 2, 10	0.7	1.3
Loudon, Tenn.	590	25	2.4	12	0.6	2, 9	1.0	1.8
Kingston, Tenn.	556	25	2.3	12, 27	0.9	2, 3, 9, 10	1.5	1.4
Chattanooga, Tenn.	452	33	3.7	14	1.3	1, 2	2.2	2.4
Bridgeport, Ala.	402	24	2.0	4	0.4	1-3	1.0	1.6
Guntersville, Ala.	349	31	4.3	16	1.6	1, 3	2.6	2.7
Florence, Ala.	255	16	2.1	17	0.0	2	1.0	2.1
Riverton, Ala.	225	26	4.4	17	1.2	2	2.8	3.2
Johnsonville, Tenn.	95	21	4.1	20, 21	0.7	4-6	2.2	3.4
Ohio River.								
Pittsburg, Pa.	966	22	12.4	21	3.3	31	6.2	9.1
Davis Island Dam, Pa.	960	25	12.7	21	2.6	1, 2, 11	5.1	10.1
Beaver Dam, Pa	925	27	15.8	21	3.0	1, 2	6.7	12.8
Wheeling, W. Va.	875	36	15.9	22	2.8	2, 3	6.1	13.1
Parkersburg, W. Va	785	36	15.0	23	3.8	1	7.1	11.2
Point Pleasant, W. Va.	703	39	14.4	24	2.7	1, 2	6.2	11.7
Huntington, W. Va.	660	50	17.8	24	5.5	1, 2	9.4	12.3
Catlettsburg, Ky.	651	50	17.4	24	3.4	2	8.1	14.0
Portsmouth, Ohio	612	50	17.8	25	5.2	2	9.4	12.6
Maysville, Ky.	559	50	17.3	26	5.1	3	9.0	12.2
Cincinnati, Ohio.	499	50	20.0	26	6.5	11	10.8	13.5
Madison, Ind	413	46	17.9	27	6.1	12-14	9.4	11.8
Louisville, Ky	367	28	8.2	27	3.1	13, 14	4.6	5.1
Evansville, Ind	184	35	16.6	29	3.4	17	7.3	13.2
Mount Vernon, Ind	148	35	16.0	29	3.3	18	6.7	12.7
Paducah, Ky.	47	40	14.0	31	3.3	13	6.5	10.7
Cairo, Ill.	1	45	23.1	30, 31	11.0	18, 19	16.0	12.1
St. Francis River.								
Marked Tree, Ark.	104	17	5.2	1, 2	4.3	14, 15	4.8	0.9
Neosho River.								
Neosho Rapids, Kans.	326	22	1.2	7, 8, 29, 30	0.2	4-6	0.9	1.0
Iola, Kans.	262	10	2.6	18	— 0.1	10	0.5	2.7
Oswego, Kans.	184	20	8.4	18	0.4	12-14	2.1	8.0
Fort Gibson, Ind. T (1).	3	22	17.2	27, 28	10.4	18	13.4	6.8
Canadian River.								
Calvin, Ind. T	99	10	4.4	2	1.8	15	2.1	2.6
Black River.								
Blackrock, Ark.	67	12	7.0	19	3.0	17, 18	4.8	4.0
White River.								
Calicorock, Ark	272	15	4.1	19	0.6	14-16	1.9	3.5
Batesville, Ark.	217	18	6.4	27	2.7	17, 18	4.0	3.7
Newport, Ark.	185	26	7.0	28-30	2.3	18, 19	4.4	4.7
Clarendon, Ark.	75	30	17.0	1	10.7	18, 19, 21	13.2	6.3
Arkansas River.								
Wichita, Kans.	832	10	0.0	1	— 0.4	23-25, 28, 29	—0.3	0.4
Tulsa, Ind. T.	551	16	3.1	1	2.5	16, 17, 24	2.7	0.6
Webbers Falls, Ind. T	465	23	10.5	20, 21, 27, 28	4.5	11-14, 17-19	6.3	6.0
Fort Smith, Ark.	403	22	12.1	29	3.8	14	6.6	8.3
Dardanelle, Ark.	256	21	12.0	30	2.8	15-17	5.7	9.2
Little Rock, Ark.	176	23	12.9	31	4.1	18	7.2	8.8
Yazoo River.								
Greenwood, Miss	175	38	4.0	31	1.0	24	2.4	3.0
Yazoo City, Miss.	80	25	1.8	3, 4	— 1.4	24	0.2	3.2
Ouachita River.								
Camden, Ark.	304	39	20.4	29	4.0	18, 19	7.6	16.4
Monroe, La	122	40	12.6	31	3.1	19, 20	5.5	9.5
Red River.								
Arthur City, Tex.	688	27	14.5	3	6.0	1, 2, 14-18	7.9	8.5
Fulton, Ark.	515	28	20.6	28, 29	7.6	17-19	13.1	13.0
Shreveport, La.	327	29	11.7	30	0.9	5	4.9	10.8
Alexandria, La.	118	33	10.1	13	2.6	24	5.9	7.5
Mississippi River.								
St. Cloud, Minn.	2,034	4	1.7	23	0.9	14-16	1.3	0.8
St. Paul, Minn.	1,954	14	6.0	26	4.8	17	5.5	1.2
Red Wing, Minn.	1,914	14	5.8	1	3.9	12, 13, 15-18	4.7	1.9
Reeds Landing, Minn	1,884	12	5.5	1	3.7	12, 13, 17	4.5	1.8
La Crosse, Wis.	1,819	12	7.4	1	4.8	14, 15, 19	5.8	2.6
Prairie du Chien, Wis.	1,759	18	8.1	2	5.2	17, 18	6.3	2.9
Dubuque, Iowa	1,699	18	8.4	2, 3	5.6	16, 17	6.7	2.8
Clinton, Iowa.	1,629	16	7.5	3-5	5.2	17	6.3	2.3
Leclaire, Iowa.	1,609	10	5.3	3-5	3.6	16, 17	4.4	1.7
Davenport, Iowa	1,593	15	6.6	4, 5	4.7	15	5.6	1.9
Muscatine, Iowa	1,562	16	7.6	6, 7	5.5	16	6.5	2.1
Galland, Iowa	1,472	8	3.7	21	2.4	17	3.1	1.3
Keokuk, Iowa.	1,463	15	6.8	21	4.3	17	5.4	2.5
Warsaw, Ill.	1,458	18	9.9	21, 22	7.2	17	8.4	2.7
Hannibal, Mo	1,402	13	8.1	22	5.3	18	6.4	2.8
Grafton, Ill	1,306	23	10.3	20	7.2	17	8.4	3.1
St. Louis, Mo	1,264	30	19.0	19	8.3	17	12.9	10.7
Chester, Ill	1,189	30	15.6	20	7.7	18	11.5	7.9
New Madrid, Mo.	1,003	34	18.9	31	9.0	18, 19	13.1	9.9
Luxora, Ark	905	33	13.0	1	3.8	12-16	7.6	9.2
Memphis, Tenn	843	33	16.7	1	5.8	16-18, 21	9.6	10.9
Helena, Ark.	767	42	25.4	1	9.3	18	14.6	16.1
Arkansas City, Ark.	635	42	31.3	1	11.4	19, 20	18.2	19.9
Greenville, Miss.	595	42	26.0	1	9.0	20	14.8	17.0

TABLE VI.—*Heights of rivers referred to zeros of gages.*—Continued.

Stations.	Distance to mouth of river.	Danger line on gage.	Highest water.		Lowest water.		Mean stage.	Monthly range.
			Height.	Date.	Height.	Date.		
Mississippi River—Cont'd.	*Miles.*	*Feet.*	*Feet.*		*Feet.*		*Feet.*	*Feet.*
Vicksburg, Miss.	474	45	28.0	2	8.7	22-24	16.0	19.3
Natchez, Miss.	373	46	28.9	3	11.5	24	18.6	17.4
Baton Rouge, La. (1)	240	35	19.4	6	5.7	25	10.6	13.7
Donaldsonville, La	188	28	14.8	3	5.2	24, 25	9.1	9.6
New Orleans, La.	108	16	9.9	2-5	4.0	26	6.7	5.9
Atchafalaya River.								
Simmesport, La.	127	33	22.5	4	7.1	25, 26	14.6	15.4
Melville, La.	103	31	25.2	4	11.5	25, 26	18.2	13.9
Morgan City, La	19	8	5.3	9	3.0	21	4.3	2.3
Grand River.								
Grand Rapids	38	11	3.2	19	1.2	8	1.9	2.0
Connecticut River.								
Hartford, Conn.	50	13	4.3	1,3	1.8	8	3.6	2.5
Mohawk River.								
Tribeshill, N. Y.	42	12	2.7	13, 14, 21	0.0	10, 11	1.1	2.7
Schenectady, N. Y.	19	15	3.6	22	1.0	{1-3, 10, 27 {28, 30, 31}	1.8	2.6
Hudson River.								
Glens Falls, N. Y.	197	20	5.0	14	3.9	11, 12	4.5	1.1
Troy, N. Y.	154	14	5.2	11	2.7	29	3.8	2.5
Albany, N. Y.	147	12	4.9	2	1.5	6	3.2	3.4
Pompton River.								
Pompton Plains, N. J.	6	8	4.6	21	3.7	6-11	4.0	0.9
Passaic River.								
Chatham, N. J	69	7	3.6	21	2.0	11	2.4	1.6
Lehigh River.								
Mauchchunk, Pa	45	15	6.3	12	4.4	7-11	4.7	1.9
Schuylkill River.								
Reading, Pa.	66	12	3.9	12	0.3	8, 10, 11	1.2	3.6
Delaware River.								
Hancock (E. Branch), N. Y.	269	12	4.3	13	3.0	9-11	3.5	1.3
Hancock (W. Branch), N. Y.	269	10	4.7	13	3.0	10, 11	3.7	1.7
Port Jervis, N. Y.	204	14	2.6	13	0.2	11	1.1	2.4
Phillipsburg, N. J.	142	26	4.3	12	1.1	11	2.5	3.2
Trenton, N. J.	92	18	4.5	13	1.2	12	2.1	3.3
North Branch Susquehanna.								
Binghamton, N. Y	183	16	5.6	13	2.4	8-11	3.1	3.2
Towanda, Pa.	139	16	4.6	13	1.5	3, 4	2.4	3.1
Wilkes-Barre, Pa.	60	17	8.5	14	3.7	11	5.2	4.8
West Branch Susquehanna.								
Renovo, Pa.	90	16	5.9	21	0.1	1, 2	2.0	5.8
Williamsport, Pa.	39	20	6.6	22	0.7	1, 2	2.7	5.9
Juniata River.								
Huntingdon, Pa.	90	24	4.7	12	3.1	1, 2, 10	3.5	1.6
Susquehanna River.								
Harrisburg, Pa.	69	17	5.0	23	1.6	11	2.9	3.4
Shenandoah River.								
Riverton, Va.	58	22	0.5	1-31	0.5	1-31	0.5	0.0
Potomac River.								
Cumberland, Md.	290	8	3.8	21	1.7	6-10	2.4	2.1
Harpers Ferry, W. Va.	172	18	1.8	30	— 1.4	8-12	—0.2	3.2
James River.								
Buchanan, Va.	305	12	2.2	12-14, 29-31	1.9	1-10, 23-25	2.0	0.3
Lynchburg, Va.	260	18	0.6	12	0.1	22-31	0.3	0.5
Columbia, Va.	167	18	5.0	12	2.5	1-3	3.0	2.5
Richmond, Va.	111	12	0.4	16	— 1.1	22	—0.2	1.5
Dan River.								
Danville, Va	55	8	1.2	12	— 0.3	9, 10, 26	0.0	1.5
Roanoke River.								
Clarksville, Va	196	12	1.6	13	— 0.7	9, 10	—0.3	2.3
Weldon, N. C.	129	30	10.7	14	8.2	11	8.7	2.5
Tar River.								
Tarboro, N. C.	46	25	2.3	15	1.3	11	1.7	1.0
Greenville, N. C.	21	22	4.3	31	3.1	14, 23-25	3.4	1.2
Haw River.								
Moncure, N. C.	171	25	8.0	10-22	4.1	1	7.6	3.9
Cape Fear River.								
Fayetteville, N. C	112	38	3.5	30, 31	1.8	5, 6	2.5	1.7
Waccamaw River.								
Conway, S. C.	40	7	2.8	2, 8, 31	1.0	12	2.0	1.8
Pedee River.								
Cheraw, S. C.	149	27	3.5	15	1.5	2, 3	1.8	2.0
Smiths Mills, S. C.	51	16	4.1	17	1.3	13, 14	2.2	2.8
Lynch Creek.								
Effingham, S. C.	35	12	4.3	31	2.8	25	3.3	1.5
Black River.								
Kingstree, S. C.	45	12	2.0	1, 2	0.3	22, 23	0.7	1.7
Catawba River.								
Mount Holly, N. C	28	15	1.7	26-31	1.5	1-15	1.6	0.2
Wateree River.								
Camden, S. C.	37	24	7.6	14	3.1	10, 31	4.6	4.5
Broad River.								
Blairs, S. C.	36	14	1.4	14	0.1	23	0.5	1.3
Saluda River.								
Chappels, S. C.	56	14	5.4	13	0.6	3	1.6	4.8
Congaree River.								
Columbia, S. C.	52	15	2.2	14	0.7	29	1.1	1.5
Santee River.								
St. Stephens, S. C.	50	12	2.6	17, 18	—0.7	13, 14	0.3	3.3
Edisto River.								
Edisto, S. C.	75	6	1.3	31	0.0	1-29	0.1	1.3
Broad River.								
Carlton, Ga.	30	11	2.7	12	1.4	1	1.8	1.3
Savannah River.								
Calhoun Falls, S. C.	347	15	8.0	12	2.0	1, 2	3.5	6.0
Augusta, Ga.	268	32	11.5	13	4.7	3	6.1	6.8
Oconee River.								
Milledgeville, Ga.	147	25	2.5	5	0.3	1	1.0	2.2
Dublin, Ga	79	30	0.4	6	— 1.3	3	—0.8	1.7
Ocmulgee River.								
Macon, Ga.	203	18	2.9	4	0.0	25	0.9	2.9
Abbeville, Ga.	96	11	2.9	7	0.0	1	1.0	2.9
Flint River.								
Woodbury, Ga.	227	10	0.8	26	— 0.1	9, 25	0.3	0.9
Montezuma, Ga.	152	20	4.1	2	1.8	1, 24-26	2.5	2.3
Albany, Ga.	90	20	2.5	4	0.0	1, 25	1.0	2.5
Bainbridge, Ga	29	22	4.2	6	2.2	2	3.1	2.0
Chattahoochee River.								
Oakdale, Ga	305	18	1.8	1, 4, 5	0.8	{8-10, 23- {25, 29-31}	1.1	1.0
West Point, Ga	239	20	3.6	2	1.6	8, 9	2.1	2.0
Eufaula, Ala	90	40	3.8	4	0.0	14, 15, 25	1.4	3.8
Alaga, Ala (3)	30	25	4.4	5	1.5	23	2.5	2.9
Coosa River.								
Rome, Ga.	271	30	4.0	12	0.4	9, 10	1.2	3.6
Gadsden, Ala.	144	22	3.5	14	— 0.2	1, 2	1.1	3.7
Lock No. 4, Ala.	116	17	2.7	14, 15	0.0	1	0.8	2.7
Wetumpka, Ala	6	45	4.8	16	0.7	1, 2	2.4	4.1
Tallapoosa River.								
Milstead, Ala.	38	35	1.7	14, 27, 28	0.3	1	1.3	1.4
Alabama River.								
Montgomery, Ala.	265	35	2.1	17	— 0.6	1-3	0.7	2.7
Selma, Ala	212	35	3.0	17, 18	— 1.4	1-3	1.0	4.4
Black Warrior River.								
Tuscaloosa, Ala.	90	43	8.4	13	4.9	2, 3, 5, 6	6.1	3.5
Tombigbee River.								
Columbus, Miss	308	33	1.9	16	— 2.4	24, 25	—1.2	4.3
Vienna, Ala.	233	42	3.2	21	1.0	8	2.2	2.2
Demopolis, Ala.	155	35	5.6	20	— 1.3	2	2.0	6.9
Leaf River.								
Hattiesburg, Miss	60	20	4.6	12	3.0	1	3.6	1.6
Chickasawhay River.								
Enterprise, Miss	144	18	2.4	26	1.2	2-6	1.6	1.2
Shubuta, Miss.	106	25	5.5	30, 31	2.1	25	3.3	3.4
Pascagoula River.								
Merrill, Miss.	78	20	4.4	11	1.2	25-27	2.3	3.2
Pearl River.								
Jackson, Miss	242	20	5.4	18	2.0	9	3.7	3.4
Columbia, Miss.	110	14	7.0	12	4.7	1	6.1	2.3
Sabine River.								
Logansport, La.	315	25	10.1	27	2.0	2, 3, 22, 23	3.7	8.1
Neches River.								
Rockland, Tex	105	20	1.6	26	0.0	16-21, 23	0.4	1.6
Beaumont, Tex.	18	10	2.1	19	0.6	29	1.5	1.5
Trinity River.								
Dallas, Tex.	320	25	19.2	4	3.0	1, 2	6.0	16.2
Long Lake, Tex.	211	35	13.2	9	1.6	6	6.3	11.6
Riverside, Tex.	112	40	7.0	25	0.3	8, 9	3.3	6.7
Liberty, Tex	20	25	9.6	26	4.2	12	6.3	5.4
Brazos River.								
Kopperl, Tex.	345	21	4.4	7	0.2	1-3	1.5	4.2
Waco, Tex.	285	24	8.0	20	3.0	3	4.5	5.0
Valley Junction, Tex.	215	40	8.5	22	1.9	5	3.9	6.6
Hempstead, Tex	140	40	9.6	23	0.6	6, 7	3.0	9.0
Booth, Tex	61	39	5.6	1	4.2	27, 30, 31	4.8	1.4
Colorado River.								
Ballinger, Tex.	489	21	2.5	3	1.7	13-19	1.8	0.8
Austin, Tex.	214	18	3.7	22	1.1	19	1.7	2.6
Columbus, Tex.	98	24	9.9	25	6.6	11	7.6	3.3
Guadalupe River.								
Gonzales, Tex.	112	22	1.5	5	0.6	28	0.8	0.9
Victoria, Tex	35	16	2.4	7	1.2	2	1.6	1.2
Rio Grande River.								
San Marcial, N. Mex.	1,030	11	6.4	1	5.6	10, 11	5.8	0.8
Red River of the North.								
Moorhead, Minn.	284	26	9.6	1	8.9	31	9.2	0.7
Kootenai River.								
Bonners Ferry, Idaho.	123	24	4.8	10	1.9	23, 31	3.0	2.9
Pend d' Oreille River.								
Newport, Wash.	86	14	— 0.6	18	— 1.3	1, 2	—0.8	0.7
Snake River.								
Lewiston, Idaho	144	24	1.2	27-29	0.3	5	0.7	0.9
Riparia, Wash.	67	30	2.5	23, 24	1.1	1, 2	1.8	1.4
Columbia River.								
Wenatchee, Wash	473	40	9.7	8-10	7.6	30, 31	9.0	2.1
Umatilla, Oreg.	270	25	4.4	9-12	3.0	26	3.7	1.4
The Dalles, Oreg.	166	40	5.7	8-12	3.5	1, 27, 28	4.6	2.2
Willamette River.								
Albany, Oreg.	118	20	3.2	9	1.0	1-6	1.9	2.2
Salem, Oreg	84	20	4.4	9	0.6	1, 3	2.0	3.8
Portland, Oreg.	12	15	4.8	9	1.8	22	3.5	3.0
Sacramento River.								
Red Bluff, Cal.	201	23	0.3	1-13, 16-31	0.2	14, 15	0.3	0.1
Sacramento, Cal.	64	25	6.7	27-31	6.4	18-22	6.5	0.3

(1) For 30 days. (2) For 26 days. (3) For 28 days.

Honolulu, T. H., latitude, 21° 19′ north, longitude 157° 52′ west; barometer above sea, 38 feet; gravity correction, —.057 applied. October, 1905.

Day.	Pressure.*		Air temperature.				Moisture.				Wind.				Precipitation.		Clouds.					
							8 a. m.		8 p. m.		8 a. m.		8 p. m.				8 a. m.			8 p. m.		
	8 a. m.	8 p. m.	8 a. m.	8 p. m.	Maximum.	Minimum.	Wet.	Relative humidity.	Wet.	Relative humidity.	Direction.	Velocity.	Direction.	Velocity.	8 a. m.	8 p. m.	Amount.	Kind.	Direction.	Amount.	Kind.	Direction.
1	30.02	30.04	80.0	77.0	81	72	70.1	61	70.7	73	ne.	9	e.	12	0.00	0.02	5 1	Ci.-s. Cu.	w. e.	4	S.-cu.	?
2	30.08	30.08	77.2	75.9	81	72	69.0	66	68.0	66	e.	6	ne.	7	0.02	0.02	9	S.-cu.	e.	4	S.-cu.	e.
3	30.08	30.07	75.2	76.0	80	72	68.7	72	68.3	67	ne.	9	e.	7	0.02	0.04	2 7	S.-cu. N.	e. e.	2 3	S.-cu. N.	e. e.
4	30.06	30.03	76.0	75.1	80	71	67.8	65	68.0	70	ne.	5	ne.	10	0.01	0.01	6 1	S.-cu. N.	e. e.	4	S.-cu.	e.
5	30.03	30.02	78.2	74.9	82	73	68.8	62	66.2	63	e.	10	e.	8	0.04	T.	2 2	Cu. S.-cu.	e. e.	1	S.-cu.	e.
6	30.06	30.04	77.4	75.0	82	70	67.8	61	67.5	68	ne.	3	e.	11	0.00	T.	3 4	Ci.-s. S.-cu.	w. e.	1 8	Ci.-s. S.-cu.	w. e.
7	30.03	30.02	77.5	70.9	79	70	69.5	67	69.4	93	ne.	7	e.	9	0.02	0.22	3 5	Ci.-s. S.-cu.	w. e	10	N.	0
8	29.99	29.95	76.1	76.2	82	72	69.0	70	66.2	59	e.	10	ne.	9	0.06	T.	3 5	Ci.-cu. S.-cu.	w. e.	5	S.-cu.	e.
9	29.98	29.98	77.4	75.2	81	72	67.9	61	68.1	70	ne.	5	ne.	11	0.00	0.01	1	S.-cu.	e.	7	S.-cu.	e.
10	30.01	30.02	71.4	74.6	81	71	69.0	88	68.5	74	se.	6	ne.	15	0.07	0.07	10	N.	e.	3	S.-cu.	e.
11	30.03	29.99	78.0	76.3	81	72	69.0	63	68.3	66	e.	13	ne.	14	0.01	T.	1	Cu.	e.	6	S.-cu.	e.
12	30.00	29.94	75.9	75.9	81	70	69.8	74	67.8	66	e.	3	e.	4	0.01	T.	9	S.-cu.	e.	4 1	Ci.-s. S.-cu.	w. e.
13	29.94	29.91	79.1	75.0	82	70	70.7	66	69.0	74	ne.	2	ne.	3	0.00	0.00	1	Cu.	e.	7	Cu.	ne.
14	29.91	29.91	76.5	76.0	80	70	71.0	76	71.2	79	se.	4	ne.	2	0.01	0.00	5 3	Ci.-cu. S.-cu.	sw. n.	4 2	Ci.-cu. S.-cu.	w. ?
15	29.99	29.98	78.2	75.4	80	72	72.2	75	70.2	77	ne.	2	ne.	1	0.01	0.02	2 3	Ci.-cu. S.-cu.	sw. e.	4	S.-cu.	0
16	30.04	30.01	79.4	75.5	83	72	70.0	62	67.5	66	e.	5	e.	4	0.00	0.00	1	Cu.	e.	few.	S.-cu.	e.
17	30.01	29.98	76.5	76.0	82	70	70.0	72	68.1	66	e.	4	ne.	8	0.06	T.	5 2	S.-cu. N.	e. e.	1	S.-cu.	e.
18	30.00	29.98	77.7	76.0	80	69	70.0	68	69.5	72	e.	17	ne.	18	0.03	0.02	1 3	Cu. S.-cu.	e. e.	6 2	S.-cu. N.	e. e.
19	30.04	30.06	77.0	75.2	81	70	67.0	59	67.0	65	ne.	6	ne.	17	0.02	0.03	1	S.-cu.	e.	9	S.-cu.	e.
20	30.09	30.07	75.4	75.2	80	71	67.9	68	67.4	67	ne.	4	e.	13	0.03	0.03	8	S.-cu.	e.	6	S.-cu.	e.
21	30.04	30.01	76.1	73.6	79	68	67.3	63	68.1	76	e.	14	ne.	20	0.06	0.04	1 4	A.-s. S.-cu.	0 e.	3 4	S.-cu. N.	e. e.
22	30.01	30.00	73.5	73.9	78	69	68.5	78	68.0	74	ne.	10	ne.	14	0.17	0.05	9	N.	e.	9	N.	e.
23	30.01	30.01	74.2	74.2	79	69	67.0	68	67.4	70	ne.	15	ne.	12	0.07	T.	9 1	A.-s. S.-cu.	w. e.	4	S.-cu.	e.
24	30.04	30.02	77.0	71.4	79	71	69.6	69	69.4	90	ne.	7	ne.	8	0.01	0.02	1 8	Ci.-s. S.-cu.	w. e.	9	N	e.
25	30.01	29.98	77.0	73.9	80	70	69.1	67	66.1	66	ne.	5	ne.	5	0.11	0.01	3	S.-cu.	e.	2	S.-cu.	e.
26	29.97	29.92	77.0	72.5	80	70	66.4	57	66.0	71	ne.	4	n.	2	0.00	0.00	1	S.-cu.	e.	2	S.-cu.	e.
27	29.94	29.91	76.5	74.7	82	69	69.2	69	69.8	78	se.	2	ne.	2	0.02	0.00	1	S.-cu.	se.	2	S.-cu.	0
28	29.97	29.99	78.1	75.6	80	68	70.1	67	70.7	78	ne.	2	ne.	2	0.00	0.00	1	S.-cu.	0	10	S.-cu.	e.
29	30.03	30.04	78.8	76.5	83	70	70.9	68	69.0	68	s.	3	ne.	8	0.00	0.00	2	S.-cu.	e.	3	S.-cu.	e.
30	30.05	30.01	77.1	76.0	82	73	68.6	65	68.0	66	e.	13	e.	8	0.00	0.00	3	S.-cu.	e.	2	S.-cu.	e.
31	30.02	29.99	76.6	76.0	81	74	67.9	64	68.9	70	e.	15	e.	5	0.00	0.00	1 3	Cu. S.-cu.	e. e.	9	S.-cu.	e.
Mean	30.016	30.000	76.8	75.0	80.7	70.8	69.0	67.5	68.3	71.2	ne.	7.1	ne.	8.7	0.86	0.61	5.2	S.-cu.	e.	5.3	S.-cu.	e.

Observations are made at 8 a. m. and 8 p. m., local standard time, which is that of 157° 30′ west, and is 5h and 30m slower than 75th meridian time. *Pressure values are reduced to sea level and standard gravity.

MEXICAN CLIMATOLOGICAL DATA.

By Señor MANUEL E. PASTRANA, Director of the Central Meteorologic-Magnetic Observatory.

October, 1905.

Stations.	Altitude.	Mean barometer.*	Temperature.			Relative humidity.	Precipitation.	Prevailing direction.	
			Max.	Min.	Mean.			Wind.	Cloud.
	Feet.	*Inches.*	° *F.*	° *F.*	° *F.*	%	*Ins.*		
Aguascalientes (Seminario.)	6,330	24.09	95.0	48.0	65.7	65	.....	ne.	.....
C. Juarez	3,805	26.14	90.0	51.0	64.9	83	1.37	e.	.....
Chihuahua	4,684	25.28	84.0	48.0	65.7	55	0.78	ne, se.	sw.
Colima, Seminario	1,663	28.49	93.0	66.0	77.4	81	2.90	sw.	.....
Guadalajara (Obs. Ast.)	5,186	24.91	84.0	57.0	69.6	78	0.80	.....	.....
Hugotitan, Hda (Jalasco.)	5,228	24.89	83.0	43.0	66.9	74	2.30	se.	.....
Jalapa	4,681	25.52	82.0	54.0	64.8	82	6.81	n.	.....
Lampazos	1,181	28.87	92.0	53.0	70.3	71	2.83	ne.	.....
Leon	5,906	24.28	85.0	49.0	67.8	68	0.61	s.	.....
Linares	1,188	28.68	99.0	52.0	73.9	74	5.59	n.	.....
Mazatlan	24	29.85	90.0	74.0	82.6	77	1.93	nw.	w.
Mexico (Obs. Cent.)	7,472	22.90	80.0	48.0	61.3	67	1.94	nw.	sw.
Morelia (Seminario)	6,401	23.89	81.0	52.0	63.9	74	2.05	.....	.....
Panal	5,674	24.55	81.0	44.0	63.3	.....	1.15	e.	.....
Puebla (Col. d Est.)	7,118	23.33	80.0	45.0	61.5	65	1.33	ne.	ne.
San Luis Potosi	6,202	24.09	81.0	50.0	63.5	57	1.12	e.	.....
Zacatecas	8,015	22.54	82.0	44.0	62.1	59	0.76	e.	ne.

*The monthly barometric means are reduced to the international standard of gravity.

RAINFALL IN JAMAICA.

Through the kindness of Mr. H. H. Cousins, chemist to the government of Jamaica and now in charge of the meteorological service of that island, we have received the following table:

Comparative table of rainfall.

[Based upon the average stations only.]

OCTOBER, 1905.

Divisions.	Relative area.	Number of stations.	Rainfall.	
			1905.	Average.
	Per cent.		*Inches.*	*Inches.*
Northeastern division	25	25	11.98	13.65
Northern division	22	48	7.57	7.84
West-central division	26	21	13.77	12.77
Southern division	27	33	16.13	10.89
Means	100		12.36	11.29

The rainfall for October was therefore above the average for the whole island. The greatest fall, 24.76 inches, was recorded at Johnson River Bridge, in the northeastern division, while the least, 4.00 inches, was recorded at Ocho Rios, in the northern division.

• Barkerville

Chart I. Tracks of Centers of High Areas, October, 1905.

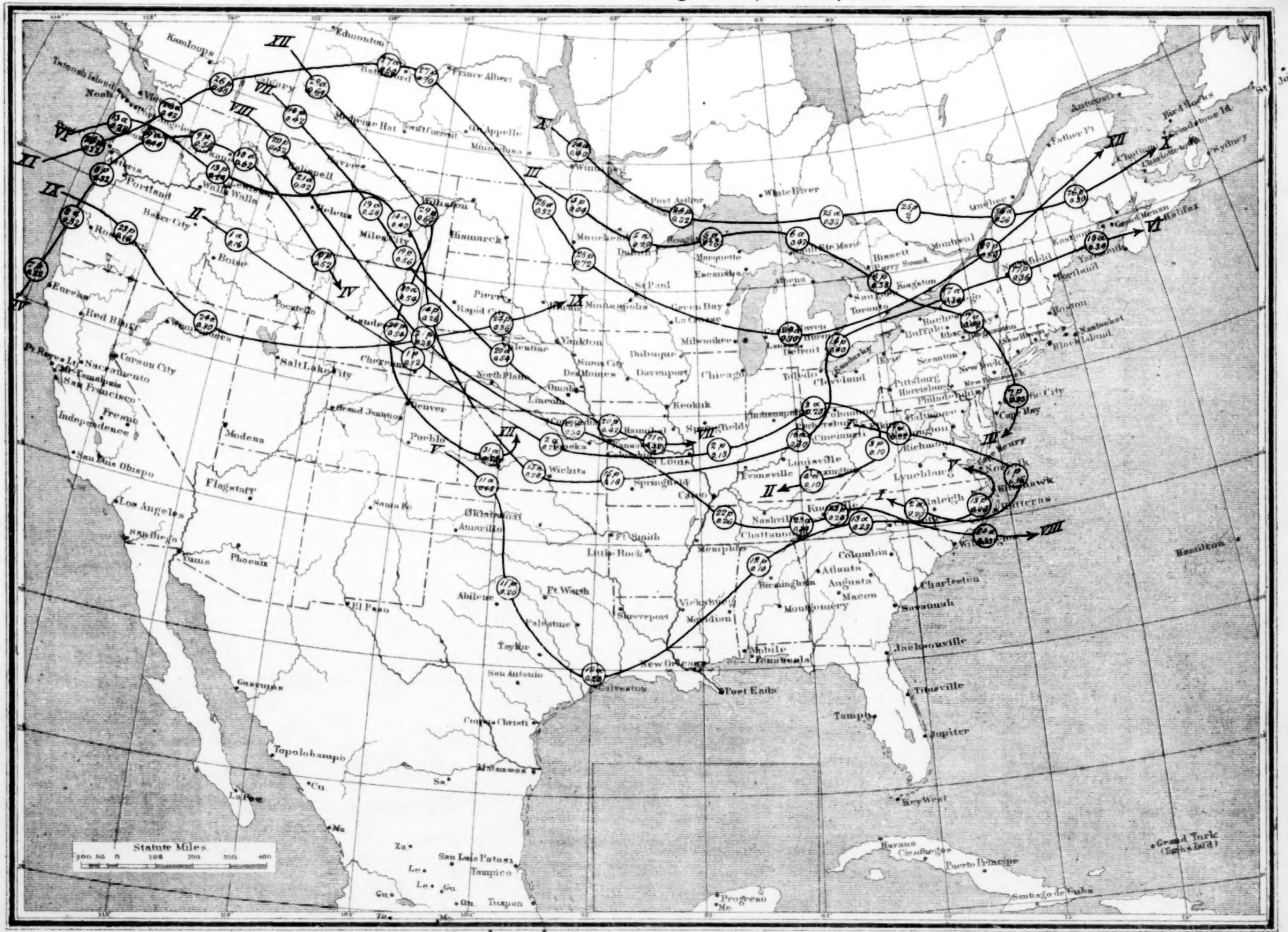

Chart II. Tracks of Centers of Low Areas, October, 1905.

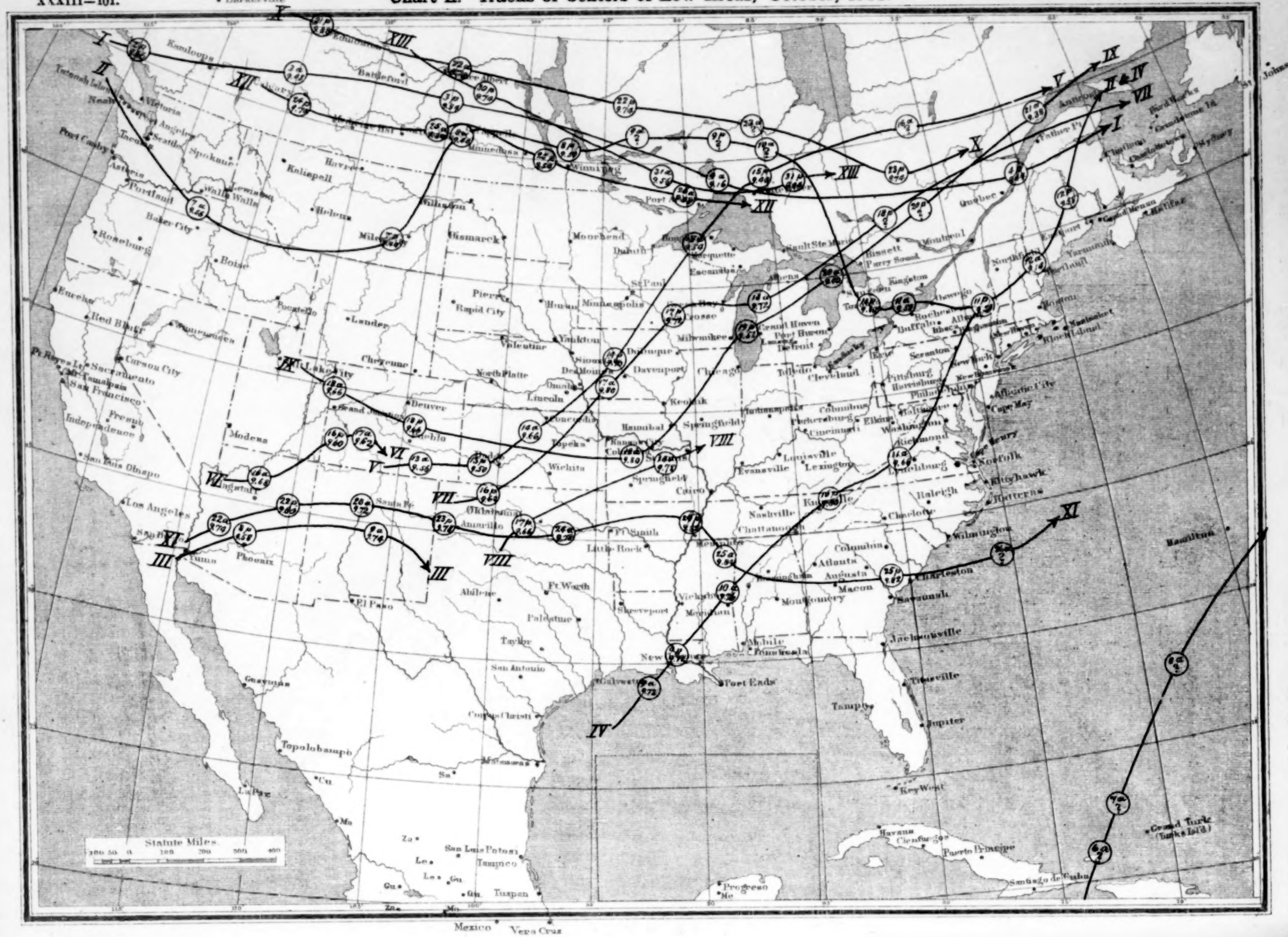

Chart III. Total Precipitation, October, 1905.

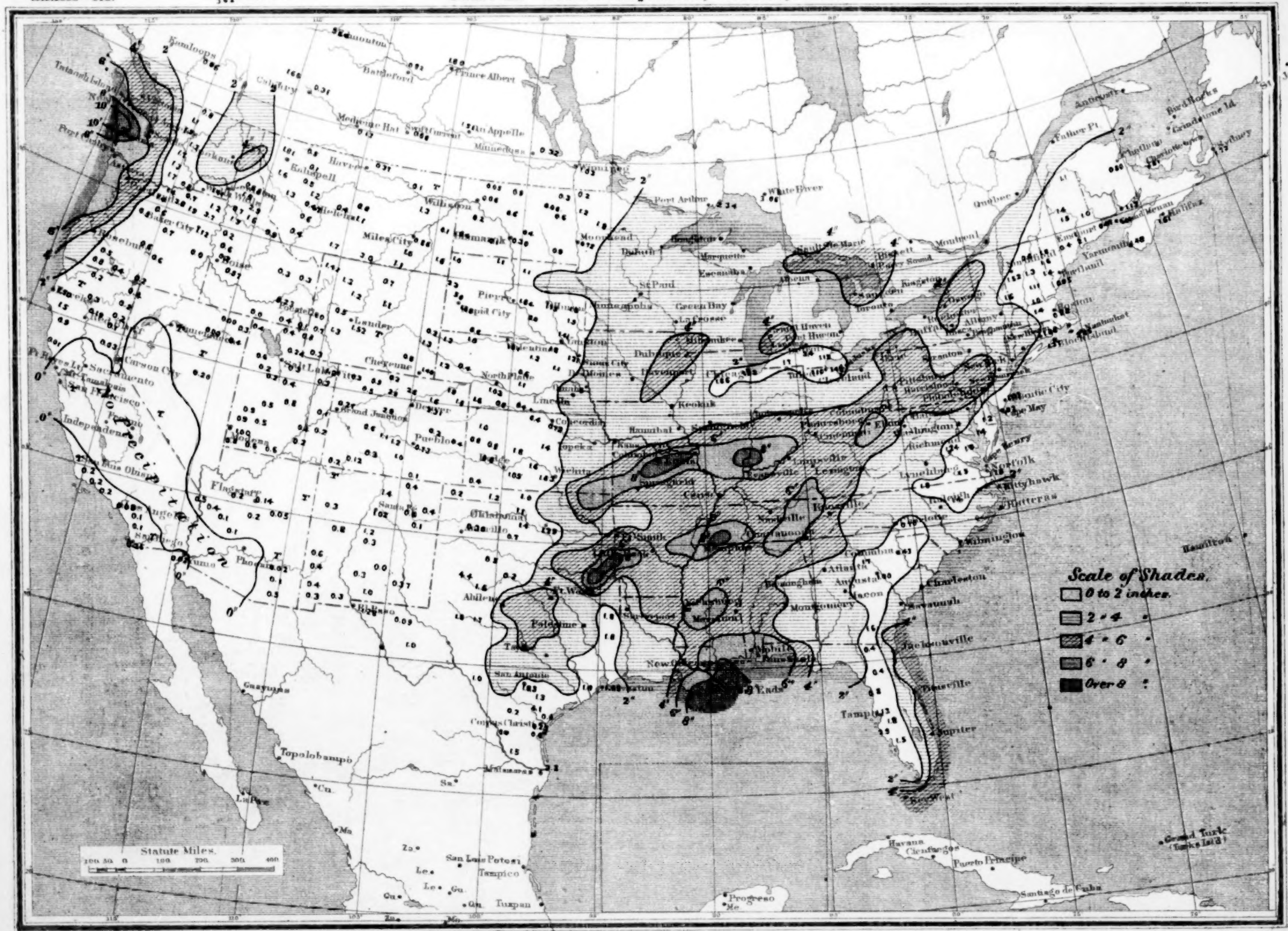

Chart IV. Percentage of Clear Sky, October, 1905.

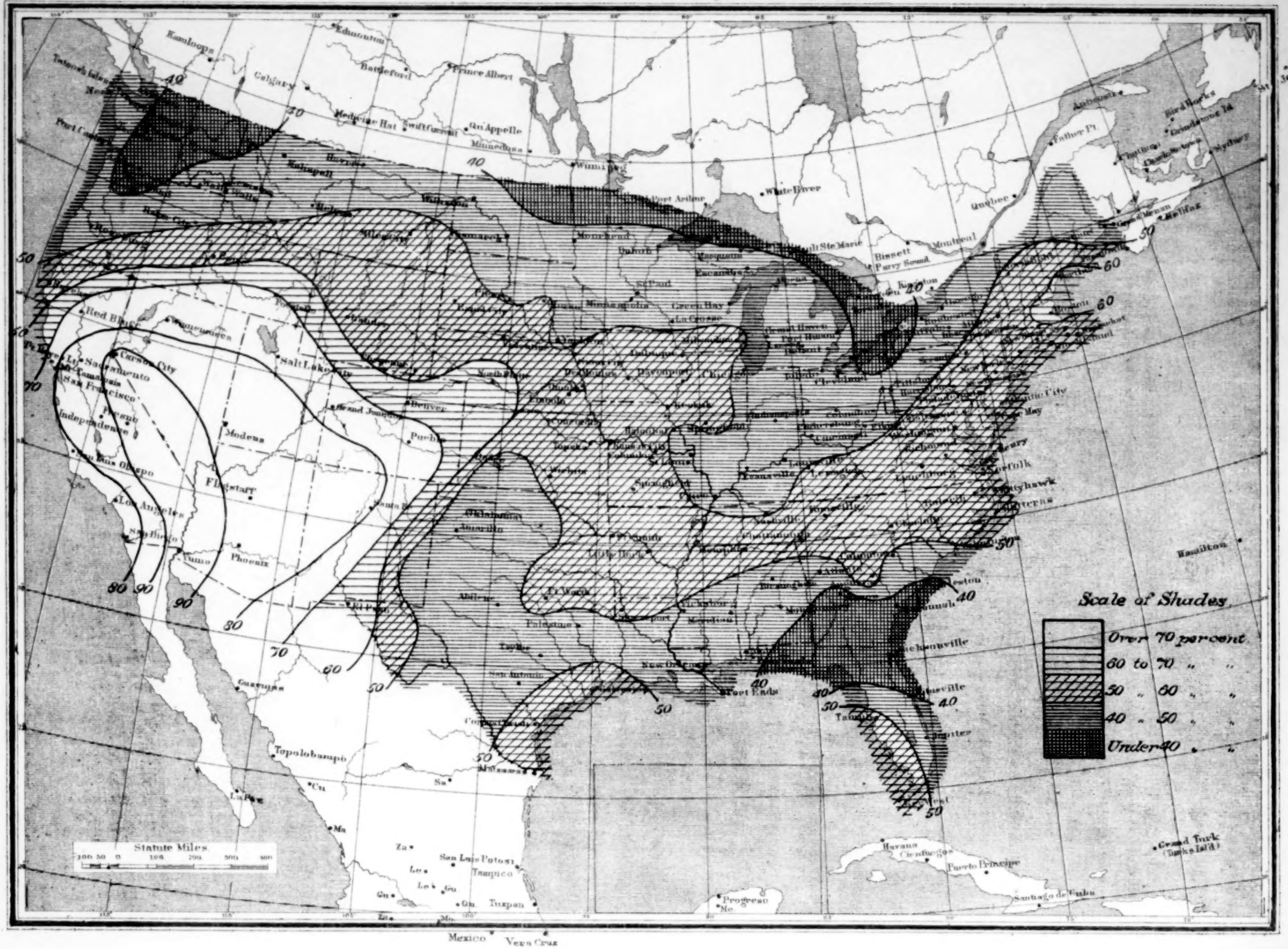

Chart V. Hydrographs for Seven Principal Rivers of the United States, October, 1905.

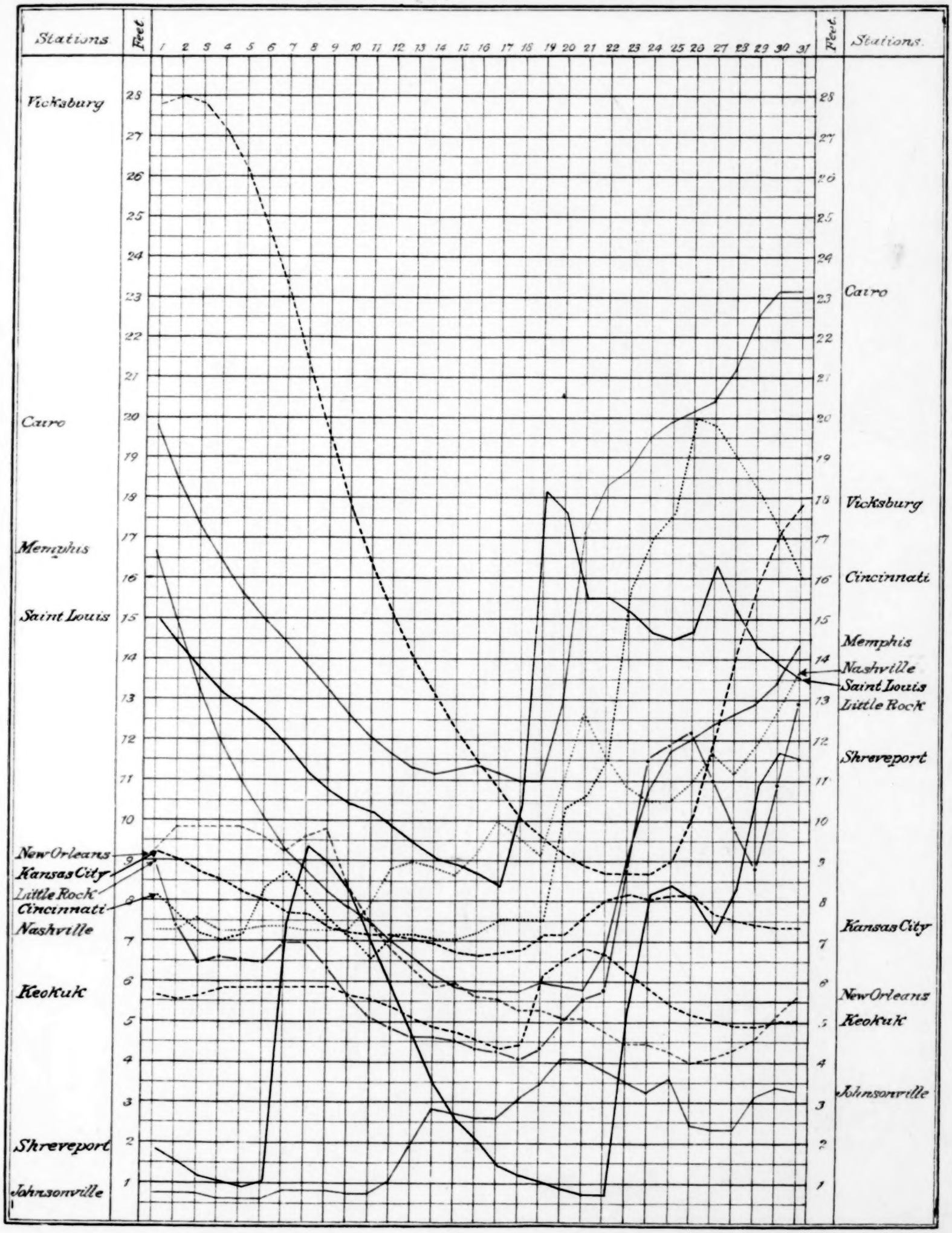

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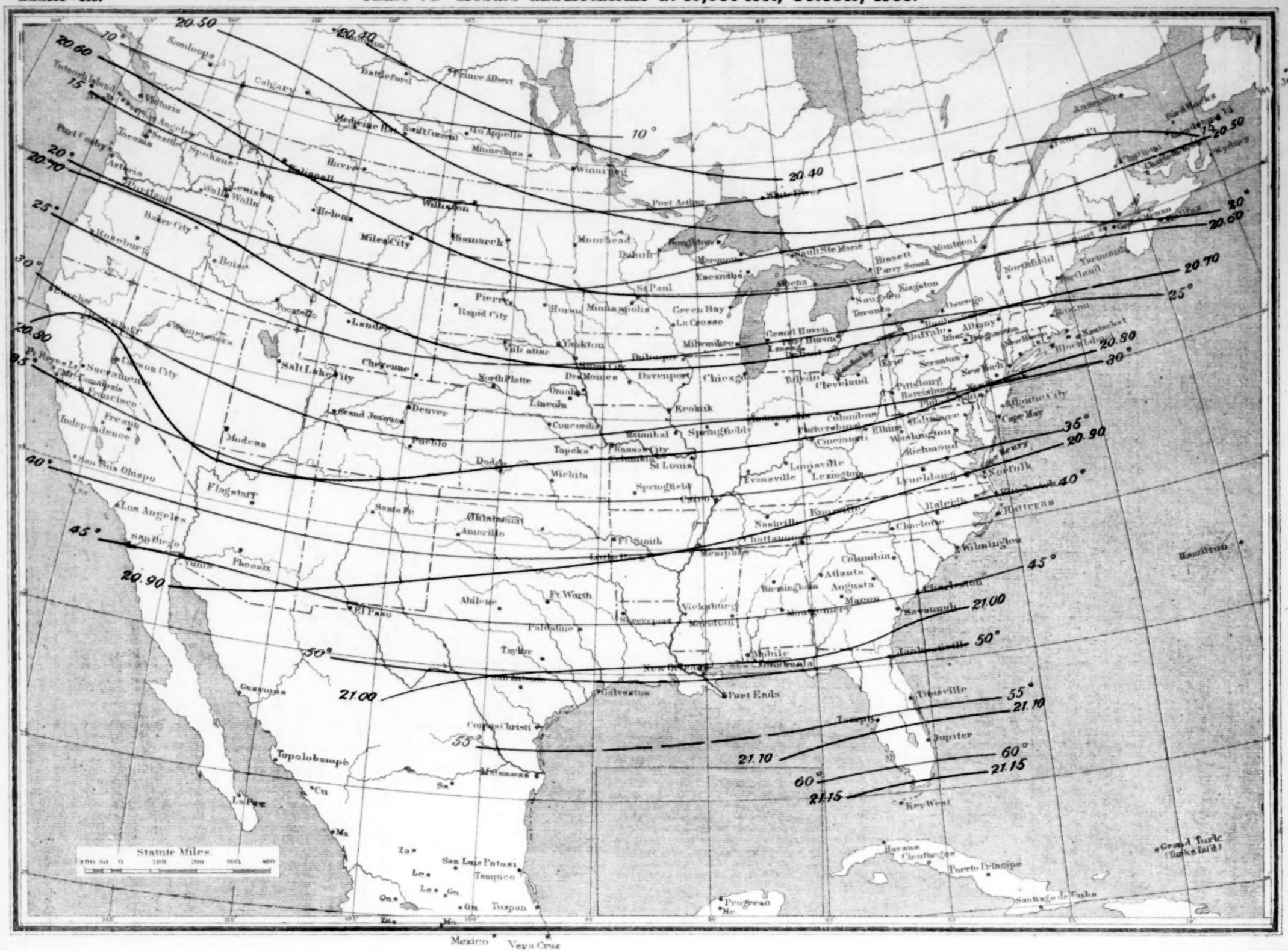
Chart VI. Isobars and Isotherms at 10,000 feet, October, 1905.



• Barkerville

Chart VII. Isobars and Isotherms at 15,000 feet, October, 1905.

• Barkerville

Chart VII. Isobars and Isotherms at 3500 feet, October, 1905.

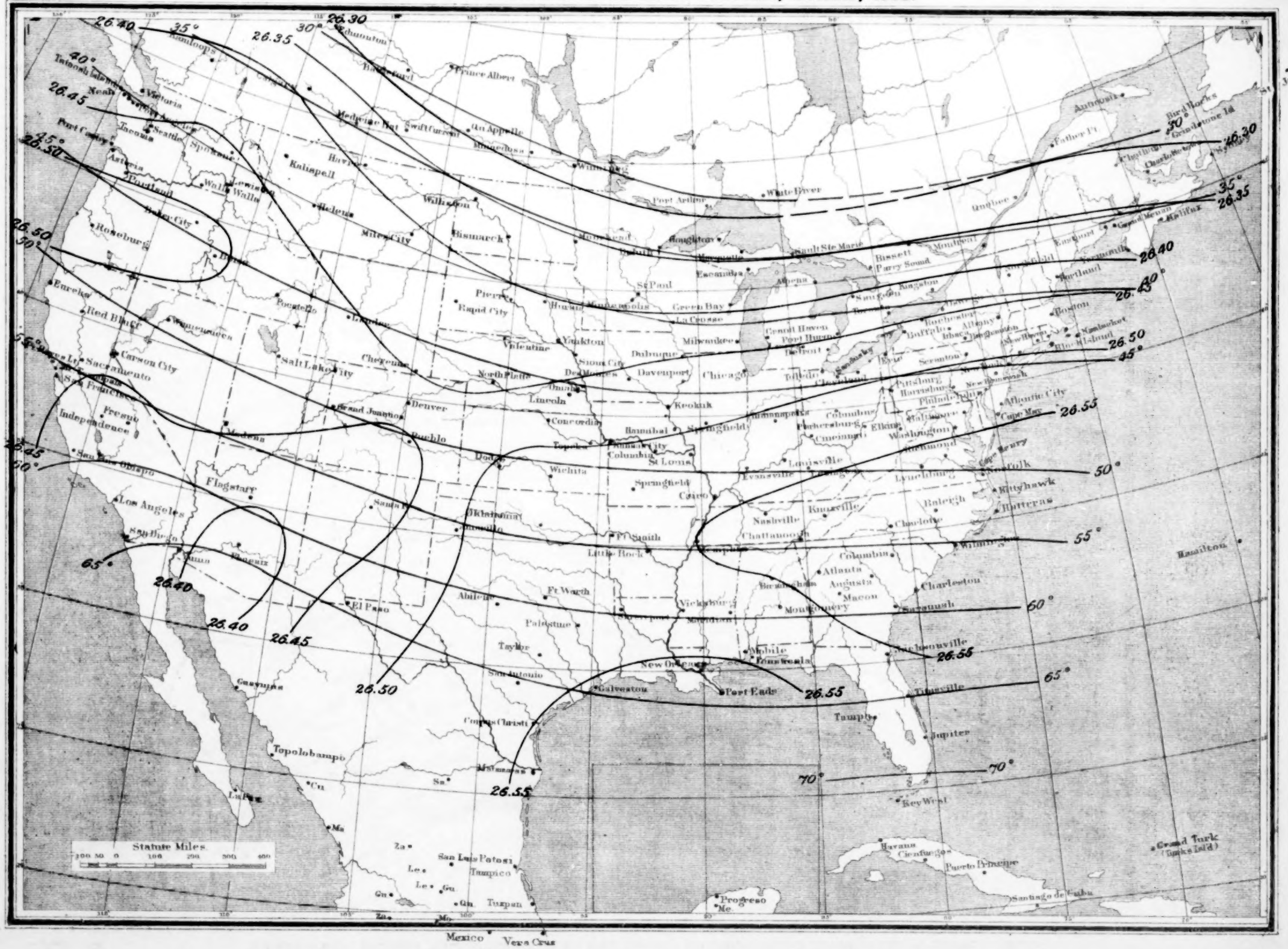


Chart VIII. Isobars and Isotherms at Sea Level; Surface Wind Resultants, October, 1905.

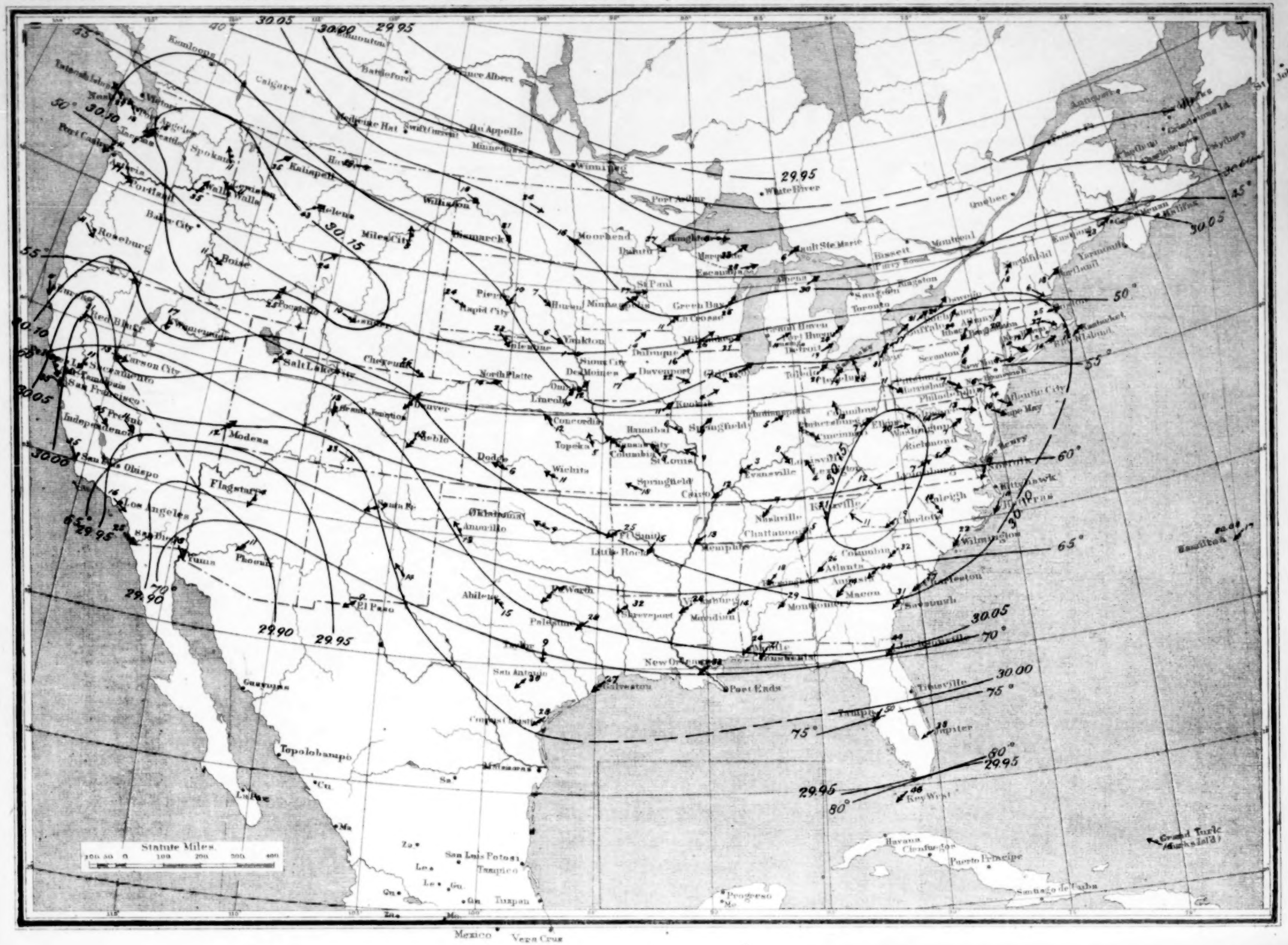


Chart IX. Sea-Level Isobars; Surface Temperatures and Wind Resultants, October, 1905.

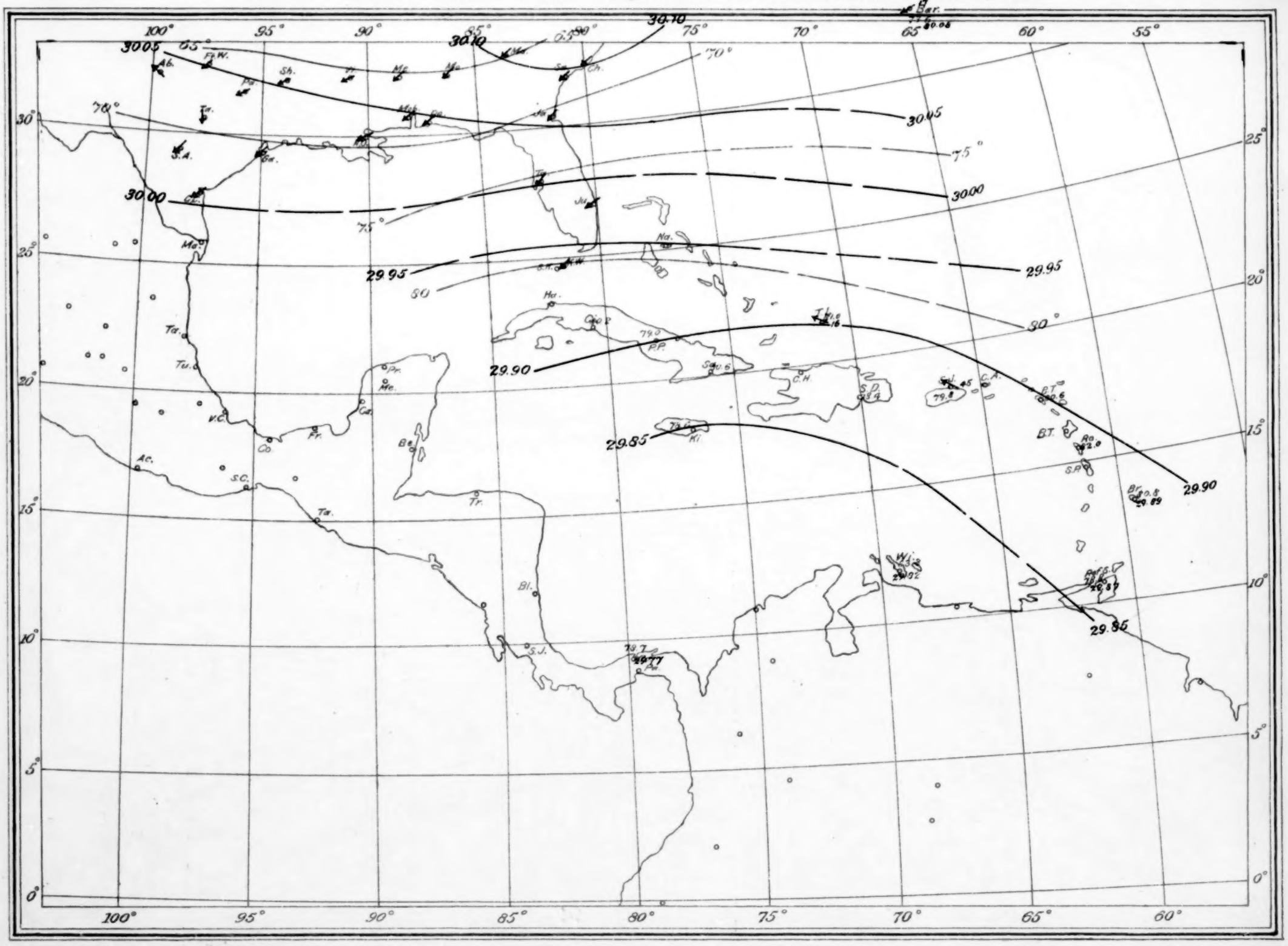


Chart X. Total Snowfall for October, 1905.